A COMPARISON OF TWO INTERVENTION STRATEGIES FOR IMPROVING THE SOCIAL STATUS OF LEARNING DISABLED ELEMENTARY SCHOOL CHILDREN

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BY

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Abstract

Twelve socially rejected learning disabled children, aged 8-12 years, participated in a 6-week training programme involving either referential communication or interpersonal problem-solving. The effects of these interventions were compared with those of an attention control group using measures of interpersonal problem-solving, referential communication, social self-concept, and social status at pretreatment, post-treatment, and 2-month follow-up. It was predicted that children trained in referential communication or interpersonal problem-solving skills would show improvement specific to the trained task and that this would in turn lead to improvements in social status and social self-concept. The findings indicated that all groups showed improvement on both speaker and listener referential communication tasks but not on interpersonal problem-solving measures. This improvement, however, was not found to be positively correlated with improvements on the social status or social self-concept measures. It was concluded that the training programmes were no more effective than the attention control group for improving learning disabled children's performance on measures of referential communication, interpersonal problem-solving, social self-concept, and social status.

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The degree to which children are accepted by their peers has been suggested as a major indicator of social adjustment (Ladd, 1985). Evidence from longitudinal studies has shown that a lack of positive peer relations in childhood is associated with social and psychological adjustment difficulties in adolescence and adulthood (Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Roff & Wirt, 1984). This apparent link between early peer relations and later social competence has led to much of the research in this area being devoted to understanding the nature of peer acceptance. Of particular interest to the present research are a number of studies which have shown two skills, referential communication and interpersonal problem-solving, to be related to the degree to which children are accepted by their peers.

Researchers have found learning disabled (LD) children to be at risk for social rejection by peers. One explanation for this problem concerns their social interactional style. Learning disabled children have been found to experience problems in both referential communication and interpersonal problem-solving. Despite evidence linking low peer acceptance with both learning disabilities and difficulties in referential communication and interpersonal problem-solving skills, causal relationships between these factors remain largely unexplored. One method of gaining an understanding of these relationships is to study the effects on peer acceptance of intervention programmes specifically aimed at improving either interpersonal problem-solving or referential communication skills.

Social Status

Social status is one component of social competence reflecting the extent to which children are accepted by their peers. Status refers to a position in a social structure, assigned on a comparative basis, and accompanied by certain privileges and duties (Carter, 1974). Five different categories of social status in children have been identified in the literature. They are: 1) popular - highly liked and not disliked; 2) controversial - highly liked but also highly disliked; 3) rejected - not liked and highly disliked (sometimes referred to as actively disliked); 4) neglected - not liked but not disliked either; and 5) average - both liked and disliked (Dodge, 1983).

The peer interactions of these groups have been assessed using behavioural observations. For example, Dodge (1983) found that popular grade 2 boys engaged in high rates of cooperative play and social interaction, shared things, and exhibited low rates of verbal and physical aggression. They approached peers equally as often as average children but maintained the interactions for longer periods of time, and were rated by peers as good leaders. Neglected boys, in contrast, were shy and viewed by peers as socially inept. Rejected boys engaged in more antisocial behaviour and were generally more verbally and physically aggressive. More specifically, these boys used more insults and threats, excluded peers from play, and were less willing to share. Controversial boys exhibited prosocial behaviours at rates similar to that of popular boys, but also showed aggressive behaviour at rates similar to the rejected boys.

Using broader categories of behavioural observations, Landau, Milich, and Whitten (1984), in their study of kindergarten boys, found a significant

relationship between behavioural observations and social status measures where solitary/uninvolved activity was found to be positively correlated with ratings on a negative peer nomination scale, and negatively correlated with ratings on the positive peer nomination scale. Unfortunately, positive interactions such as playing together were only modestly correlated in the expected directions with peer popularity and rejection.

A number of different measures have been developed to assess social status in children. Such measures as naturalistic observation and teacher and parent ratings have been criticized for taking the adult's perspective rather than the child's, a potential problem since adults may not be sensitive to the same differences in social behaviour as children (Carlson, Lahey, & Neeper, 1984). To overcome this problem, a variety of sociometric measures have been designed in which children are rated by their peers.

Sociometric Ratings

These peer-referenced measures have become the most widely used method for assessing a child's social status (Foster & Ritchey, 1979). Two of the more common are nominations and roster rating scales. The most common sociometric technique, peer nominations, initially developed by Moreno in 1934 (Dodge, 1983), is a limited choice measure yielding an index of the number of friends of a given child. It is believed to be a measure of "high priority friendships" (Asher & Taylor, 1981, p.15) and involves having members of a social group, usually a classroom, fill out a questionnaire nominating a certain number of their peers according to a specified criterion (Asher & Hymel, 1981). Although the majority of studies have only used positive nominations (e.g., "Name three children you

especially like"), negative sociometric criteria (e.g., "Name three children you don't like very much") have also been employed. Both positive and negative nominations used in combination have the advantage of allowing for the differentiation of neglected and rejected children. In other words, neglected children will receive few ratings on both measures whereas rejected children will receive high ratings on negative nominations but low ratings on positive nominations.

The positive nomination measure is considered stable over time yielding test-retest reliabilities of .52 over a 1-year period and .42 over a 2-year period (Asher & Hymel, 1981). The test-retest reliabilities for negative nominations scores, as reported by Roff, Sells, and Golden (1972), were .38 and .31 for 1- and 2-year periods, respectively.

In contrast to measures of high priority friendships, the roster rating scale measure is believed to assess a more general acceptance dimension (Foster & Ritchey, 1979; Singleton & Asher, 1977). For this measure, children are provided with a list of all the children in a specified group. Each child is then asked to rate each other child, by responding to such questions as "How much do you like to play/work with this person at school?", using a 3- or 5-point Likert scale. This provides an indication of each child's perception of every classmate and prevents the likelihood of some children not being chosen because they were momentarily forgotten, which can occur with other sociometric measures.

The most attractive feature of this measure is its test-retest reliability. Oden and Asher (1977) found a median correlation of .82 for the "play with" scale and .84 for the "work with" scale, for third and fourth grade children over a 6-week

period. This high level of reliability is likely due to each child's score being an average of the ratings obtained from a large number of peers. A change in the rating of one or two peers over time would thus have little effect on a child's overall score, whereas, with the nomination measure, where children typically receive only a few positive or negative nominations, a gain or loss of a single nomination would be quite dramatic in terms of the distribution of scores (Asher & Hymel, 1981). Unfortunately, the roster rating scale alone is not capable of differentiating between neglected and rejected children because it only asks children how much they would like to play/work with each child and doesn't assess how much they would dislike to play/work with them. As a result, many researchers have resorted to using both peer nomination and roster rating measures when assessing peer social status in order to benefit from the assets of both and make up for the disadvantages of using either one alone.

The major emphasis in research has been on the unpopular children as opposed to the popular ones. The unpopular group, made up of neglected and rejected children, has been found to be heterogeneous with respect to social impact, behaviour, and problems, not to mention the likelihood of differences in their response to social intervention programmes. A study by Carlson et al., (1984) examined behavioural differences between socially accepted, rejected, and neglected second and fifth grade children as measured by positive and negative peer nominations. Using the Children's Social Behaviours Inventory (CSBI), which lists descriptions of social behaviours, each child was rated by their peers as showing or not showing each particular behaviour. An attempt was then made to identify those social behaviours which discriminated the three groups. Those items

which differentiated rejected from accepted children included a greater tendency toward nonparticipation, as well as being seen as less helpful, not willing to wait one's turn, and less adept at explaining things to others. Rejected children were found to differ from both accepted and neglected children, being viewed by peers as more likely to refuse overtures, to change the subject in conversation, and less likely to share. In general, they were seen as less knowledgeable about how to join in group activities, and less honest. Neglected children were also found to differ from both rejected and accepted children, where neglected children were seen as less inclined to say they could beat everyone up. The authors concluded that rejected children were rated by peers as being quite distinct behaviourally from other sociometric groups.

A distinction between neglected and rejected children is of importance since research suggests that of these children the rejected group is at greater risk for later adjustment problems (Coie & Dodge, 1983; Coie & Kupersmidt, 1983; French & Waas, 1985). Research by Coie and Kupersmidt (1983), using unfamiliar peer ratings, found that the status of rejected children showed a greater consistency in behaviour across new situations than that of neglected children. In other words, neglected children were found to change their patterns of social interaction in new situations more readily, suggesting their status is more situationally determined. In contrast, the behaviour of rejected children was found less likely to change, resulting in these children receiving a rejected status in new situations as well as old. Similar results were also reported in two other studies (Dodge, 1983; Putallaz, 1983) where unfamiliar peer ratings were used.

A longitudinal study by Coie and Dodge (1983) of children in grades 3 to 5

also examined the stability of social status. They found that popular status was moderately stable over a 1-year period - 36% of the children rated as popular at initial testing were rated as popular 1 year later. This stability decreased over longer time intervals, where only 28% were popular after a 2-year period, 34% after 3 years, and 21% after 4 years. Of concern is the finding that the ratings for rejected children showed the greatest stability over time. After 1 year, 45% of the rejected children were still rated as rejected, 34% after 2- and 3-year periods, and 30% after 4 years. This stability was greater with the fifth grade group than with third-graders. For the neglected children, their status remained the least stable, with 25% maintaining a neglected status after 1 year, 27% after 2 years, 22% after 3 years, and only 14% after 4 years.

These studies suggest three important conclusions concerning social status. Firstly, they suggest that stability in the status of the rejected group appears to be one explanation for their greater risk for later problems. Secondly, they provide support for the validity of unfamiliar peer ratings in the assessment of social status. Finally, these findings shed some light on the causal relationship between social behaviour and social status, where, at least with respect to rejected children, negative interactional style predicts low status (Renshaw & Asher, 1982).

Due to concerns raised by the stability of the rejected status and the increased risk of negative outcome, a number of populations have been assessed in an effort to examine possible over-representation in the rejected status category. One such population has been learning disabled children.

Social Status of Learning Disabled Children

There has been much controversy in the literature with respect to a definition of learning disabilities, although repeated attempts by individuals and organizations have led to some consensus. For the purpose of this study, the term learning disabilities is defined as:

> ...a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairments, mental retardation, social and emotional disturbances) or environmental influences (e.g., cultural differences, insufficient/inappropriate instruction, psychogenic factors), it is not the direct result of these conditions or influences (Myers & Hammill, 1982, p. 6).

Perhaps the earliest of studies examining the social status of LD children, which was used as a prototype for later research, was undertaken by Bryan (1974). Using measures of social rejection as well as social attraction (positive and negative peer nominations, and the "Guess Who" technique), she compared LD and nonLD children in grades 3 to 5. Learning disabled children were defined as those children who had been labelled LD by the school board, had received tutorial assistance, and whose performance on an intelligence test yielded a minimum score of 80. The mean percentage of negative nominations received by LD children (11%) was found be significantly greater than the mean percentage found for the control group (6%). Similarly, LD children showed a significantly lower percentage of nominations (4%) than control children (8%) on the social acceptance measure.

A percentage of these children were then followed up 1 year later and assessed using the same measures (Bryan, 1976). The results once again indicated that LD children, in comparison to nonLD children, received significantly more votes on the social rejection scale and significantly fewer votes on the social attraction scale. As well, it was found that the status of those children previously rejected by their peers remained stable even when their classes had undergone a change of more than 75% of the children. This study serves to replicate the findings of the original study by Bryan (1974), as well as showing the stability of status over time.

Differences in the social status of LD and nonLD children has been further reported with both similar age groups (Gottlieb, Gottlieb, Berkell, & Levy, 1986), as well as with adolescent populations (Coben & Zigmond, 1986). Pearl, Bryan, and Donahue (1983) reviewed the research examining the social behaviour of LD and nonLD children both in naturalistic classroom settings and more structured experimental situations. Overall, they concluded that LD children's social behaviour differed from that of nonLD children and that these differences in interactional patterns could play a part in eliciting negative reactions by peers. Wiener (1987) also reviewed the literature comparing LD and nonLD children's social status. Of the 19 studies reviewed, including the two previously noted by Bryan (1974; 1976), 14 assessed elementary school children. Only four of the studies found no differences between LD and nonLD children, which the author contributed to methodological shortcomings of the studies. Wiener (1987) concluded from this that "...the data in the literature overwhelmingly indicated that LD children obtain lower peer status scores than NLD [nonLD] peers in

elementary school..." (p. 64). Therefore, the research appears to indicate that LD children are at greater risk of being socially rejected by their peers in comparison to their nonLD counterparts.

Given the finding of LD children's rejection by peers, as well as research by Rosenthal (1973) indicating that the means by which individuals value themselves depends greatly on how they are valued by others, one would expect that rejection by one's peers would have quite an impact on the LD child's self-concept.

Self-Concept of Learning Disabled Children

A review of the literature on self-concept suggests a lack of consensus as to an operational definition of this term. Beane & Lipka (1980) defined self-concept as "...the perception one holds of oneself, totally and with regard to several dimensions, and which is influenced by environmental interaction" (p.1). More specifically, it is a valuing process in which one makes judgments regarding personal satisfaction with roles and/or quality of performance. These evaluations are believed to be a function of the environmental context in which the role is played (Beane & Lipka, 1980).

Given that sociometric ratings indicate that LD children are at greater risk of being rejected by their peers, one would also expect this population to be at risk of having a lowered self-concept, at least as far as social status is concerned. It appears from the literature that peers who are willing to react with compassion to learning problems related to cerebral palsy, blindness, or deafness are often found to express frustration towards LD children because of the lack of a discernible cause for their problem (Rosenthal, 1973).

Several factors are believed to contribute to the development of self-concept. Coleman and Fults (1982) hypothesized that in the absence of objective standards of comparison, one's self-concept develops by way of comparing one's abilities with those of significant others who are relatively similar. Given that LD children are now generally in regular classrooms, their comparison group is likely to be primarily made up of normally-achieving children. In fact, a number of studies have established a relationship between poor academic achievement and low self-concept in LD children (Black, 1974; Boersma & Chapman, 1981).

However, very little research has assessed that aspect of self-concept related to the social experience. One such study by Sobol, Earn, Bennett, and Humphries (1983) compared 7- to 12-year old LD children with low-accepted and high-accepted nonLD children of the same age with respect to their social self-concept. Categorization of children into groups of high and low acceptance was based on ratings from a social acceptance measure (Pupil Rating Scale) filled out by the child's teacher. Comparison of the low-accepted children with the LD group allowed for examination of the influence of learning disabilities while controlling for the effects of low social acceptance. In contrast, the use of a high-accepted group provided a test of the effect of social acceptance. A measure of self-concept, taken from the Coppersmith Self-Esteem Inventory, was administered to all children. A significant difference was found on this measure between the LD and high-accepted groups but not between the LD and low-accepted groups. Overall, the LD children showed the lowest scores on this measure, followed by the low-accepted group. The high-accepted group, in contrast, showed the highest scores. This pattern of scores was also characteristic of all groups concerning their

expectations of success in social situations, based on the results of a questionnaire devised by the authors to assess perceived self-competence. The authors concluded that LD children, in general, experience lowered social self-concept.

Overall, these results provide some support for the theory that social self-concept is related to social status. In light of the earlier discussion on social status, one may hypothesize that LD children are a higher risk group for later adjustment problems than nonLD children. In order to enhance the social status of LD children as well as that of other children considered unpopular by their peers, it is important to establish what factors serve to differentiate them from popular children. A number of possible explanations have been examined throughout the literature. Although a great deal of controversy remains, the majority of these studies support the hypothesis that sociometric status is reflective of children's social interactional style, particularly with respect to ingratiation tactics (Donahue, Pearl, & Bryan, 1983). Two skills linking social status and interactional style are referential communication and interpersonal problem-solving.

Referential Communication

The literature indicates a relationship between effective dyadic verbal communication, as measured by responses on a referential communication task, and peer popularity (Gottman, Gonzo, & Rasmussen, 1975; Putallaz & Gottman, 1981; Rubin, 1972). Referential communication refers to the ability to communicate information concerning a particular referent (Asher, 1979), which may be an object, a location, or an idea. This skill has traditionally been assessed by use of the following paradigm developed by Glucksberg and Krauss (1967).

One person (the speaker) is asked to describe a referent object or picture so that another person (the listener) will be able to choose the correct referent from a group of potential referents. The number of correct referents identified by the listener provides a measure of the pair's communicative competence (Patterson & Kister, 1981). Referential communication skills are believed to be critical for communication (Noel, 1980). Basic skills necessary for effective referential communication include an adequate vocabulary, efficiency in language production or expressive language skills, and a basic understanding and knowledge of one's role as a listener and speaker.

Knowledge of the age of acquisition of listener and speaker skills is important for identifying deficits or delays in particular children as well as for providing a basis upon which to focus intervention programmes for facilitating performance on these skills. The adequacy of both speaker and listener roles is dependent upon a number of different components which generally develop between the ages of 4 and 8 years.

The success of speakers on a referential communication task depends on their ability to provide the listener with adequate, informative messages. Perspective-taking, based on the assessment of listener characteristics and informational needs (Roberts & Patterson, 1983); the identification of features of a referent which distinguish it from nonreferents and the ability to make comparisons of similarities and differences (Whitehurst & Sonnenschein, 1978; 1981); the further utilization of this information for selecting appropriate message content (Whitehurst & Sonnenschein, 1981); and the monitoring of the success and failure of communication efforts and the repair of communication breakdowns (Cosgrove

& Patterson, 1979) are the major components of the speaker's role.

These skills have all been found to develop, at least in some rudimentary form, in nonLD children around the age of 5 years. However, they do not necessarily develop simultaneously. For example, Whitehurst and Sonnenschein (1981) found that although children between the ages of 4 and 5 years were able to specify differences between referents when asked, they did not automatically make comparisons on the referential communication task. When faced with a listener's request for more information, children of this age have been found to make some attempt to respond, without necessarily providing any additional information unless the task was very simple and the feedback identified specific message deficits (Cosgrove & Patterson, 1979). As well, children at this age have shown some skill in identifying the segment of the message that is uninformative, but only some of these children show the ability to make the appropriate revisions as well (Beal & Flavell, 1982; Beal, 1986).

Essential to listener-role performance is the ability to evaluate the adequacy of the speaker's messages (Asher, 1976; Patterson, O'Brien, Kister, Carter, & Kotsonis, 1981), to utilize the information contained in the message to choose the target referent (Cosgrove & Patterson, 1977; Ironsmith & Whitehurst, 1978), and when faced with an inadequate message, to point out the ambiguities and/or to request more information. These have been shown to be acquired by nonLD children, at least at a basic level, as early as 4 years of age, although Ironsmith and Whitehurst (1978) found that children of this age responded equally often to ambiguous messages as they did to informative messages. For 5- to 8-year olds, judgment of message adequacy was found to be very much influenced by the

success of the communication (Singer & Flavell, 1981), and communication failure was largely blamed on the listener (Robinson & Robinson, 1978). As well, the ability to provide appropriate listener responses spontaneously, when faced with an inadequate message, appears to develop as late as grade 6 (Cosgrove & Patterson, 1977; Ironsmith & Whitehurst, 1978). The use of alternative strategies to asking questions, such as guessing, when faced with ambiguous messages is believed to limit young children's communicative effectiveness substantially. This suggests that although 4- and 5-year old children possess some of the basic skills needed for effective referential communication, they still fail to appreciate the role of the message in the communication process.

Although extensive research has led to some understanding of the development of referential communication skills in children, a number of factors have been identified which contribute to discrepancies in children's performance at various ages. The first factor is the actual complexity of the task. Research employing stimulus arrays which are numerous and complicated or involve messages that are only partially informative generally yields relatively higher age norms for successful performance than that employing less complex tasks (Patterson & Roberts, 1982; Watson, 1977; Whitehurst & Sonnenschein, 1978).

The second factor affecting performance on a task is the particular aspect of referential communication being tested, since these skills develop hierarchically. Specifically, perspective-taking is the earliest skill to be acquired, followed by comparison activity (Patterson & Kister, 1981), making exhaustive comparisons, detecting both verbal and nonverbal ambiguity (Flavell, Speer, Green, & August, 1981; Patterson, Cosgrove, & O'Brien, 1980), and finally providing feedback, first

implicitly through guessing or stating noncomprehension, and then explicitly. Therefore, a study emphasizing the development of children's ability to recognize that another person's state of knowledge differs from their own will be likely to yield differing results, with regard to the age of acquisition, than a study focusing on children's ability to provide explicit feedback when faced with inadequate messages.

The particular procedure used to assess a given skill is a third factor influencing performance on a referential communication task. Some studies attempt to examine children's ability to speak and listen independently of each other. This has been considered artificial in comparison to a real life communicative interaction where feedback from the listener enables the speaker to determine whether or not the message was received and understood by the listener and further allows the speaker to alter the message in accordance with this feedback (Sonnenschein, 1986).

An additional problem related to the interpretation of the findings is that many of the studies on referential communication have used adults as partners for children rather than peers. Having adults participate in the task may cause children to feel that they are not responsible when communication breakdown occurs since children may assume adults are effective communicators and thus share the child's knowledge of the referent. This may result in the child providing only the most minor of details for differentiating the pictures.

As a result of these factors, it is rather difficult to make a clear distinction between a child who has acquired referential communication and one who has not. Specifying developmental stages of skill acquisition is even more difficult. From a

hierarchical perspective, however, it does appear evident that component speaking and listening skills develop earlier than those components involving message evaluation (Sonnenschein & Whitehurst, 1984b).

Development of Referential Communication in LD Children

Regardless of the methods used to assess referential communication, the literature on the development of referential communication in LD children appears to indicate a general delay in abilities compared to nonLD children. This delay has been found to be associated with differences in the utilization of strategies for improving performance, in the choice of verbal descriptions of referents, and in information processing abilities.

Both Noel (1980) and Spekman (1981) compared 9- to 11-year old LD and nonLD boys in terms of their ability as speakers to produce informative messages, and as listeners to use message content to select correct referents. Although different tasks and methods of assessment were used, both studies found group differences between LD and nonLD children in speaker but not listener skills.

Spekman (1981) compared the performance of dyads containing LD and nonLD boys with dyads containing only nonLD boys. Each member of the dyad alternated roles as a speaker and a listener. The task involved a set of 16 blocks varying in colour, size, shape, and thickness. Eight blocks were used to make each of six geometric designs. Each speaker was asked to communicate to their listener in such a way that the listener could construct his/her own set of blocks in a similar fashion. In terms of overall speaker task success, nonLD dyads were found to perform better than dyads containing LD children despite equivalent use of time and quantity of interaction. With respect to speaker variables, when dyads

invoived a LD speaker and a nonLD listener, the LD speaker provided significantly less task-related information in comparison to dyads with a nonLD speaker and listener. Of particular interest was the finding that LD speakers less frequently described the block design in terms of a gestalt compared to nonLD speakers. In contrast, no differences were found between LD and nonLD speakers in their ability to provide the correct and appropriate replies to their listener's equests for more information. This finding is strengthened by similar results reported by Pearl, Donahue, and Bryan (1981), with 6- to 12-year old LD children, when listener responses were controlled by having the experimenter play the role of the listener.

In terms of listener variables, Spekman (1981) also assessed the performance of LD listeners with either LD or nonLD speakers. The results indicated that both LD and nonLD listeners followed directions equally well, asked the same number of questions, and had the same percentage of questions requesting redundant information. However, with regard to requests for information, nonLD children showed a tendency to make more efficient use of their questions such that they gained more new, task-relevant and needed information. The author noted that both LD and nonLD children demonstrated certain skills rather inconsistently, suggesting these production problems are common to children whose skill is in the early stages of acquisition.

One criticism of many studies is in the use of dyads for studying effective communication. The difficulty with this method is in determining the exact cause of the communication failure. To overcome this a few studies (Feagan & Short, 1986; Mathinos, 1988; Noel, 1980; Pearl et al., 1981) have employed a standard

speaker, using either a child or an adult confederate, a puppet, or tape recordings.

To examine speaker skills, Noel (1980) used tape recordings of children who had been instructed to describe a series of six black and white line drawings of ambiguous and novel figures in such a way that they could be identified by the examiner. Written transcripts of the speakers' descriptions were then categorized according to content by two independent raters. Results showed a trend towards LD boys having slightly shorter descriptions than nonLD boys, as well as making differential use of description types. For example, LD boys more frequently used the shape category, referring to an object directly by shape such as, "It's pointed". In contrast, nonLD boys more often named the object or used a label to describe it such as, "It's a hat". It was concluded from this that LD boys show deficits in speaker skills on referential communication tasks, particularly in their use of labeling and the quality of their verbal descriptions. These findings are likely related to poorer information processing skills on the part of LD children.

On the listener task, the boys were asked to listen to randomly selected recordings (eight descriptions of each of the six figures) made by both LD and nonLD speakers and to choose the appropriate picture to fit the descriptions given. Although nonLD listeners were found to be slightly more accurate responders than LD listeners, both in selecting a correct target following a clear message and in indicating ambiguity following an unclear message, this difference was not found to be significant. The major significant finding was that both LD and nonLD listeners were found to be less accurate listeners when descriptions were presented by LD versus nonLD speakers. This supports the findings of the speaker task that LD speakers provide more inadequate messages than nonLD

speakers.

Common to the studies by Noel (1980) and Spekman (1981) was the finding that lower success and efficiency scores obtained by LD children could be accounted for by group differences in the content of the descriptions. Contrary to this, a recent study by Mathinos (1988) found that although 9- to 13-year old LD children were less efficient in their descriptions of referents in comparison to their nonLD counterparts, their descriptions were similar in nature to those formulated by nonLD children. The author speculated that differences in effectiveness were perhaps the result of differential use of strategies such as limiting the number of referent-nonreferent comparisons needed by turning over already identified referents, and organizing and categorizing the referents prior to the beginning of the task. These strategies serve to decrease the likelihood of making an erroneous choice and were observed to be used more frequently by nonLD children.

Feagan and Short (1986) assessed speaker and listener skills of LD and nonLD 6- and 7-year olds over a 3-year period. The study tested children's ability to comprehend a sequence of instructions for learning a puzzle box task (listener skill) as well as their ability to communicate this sequence of instructions to a puppet (speaker task). The directions of the task were read to children until perfect performance was achieved and the number of trials to criterion was recorded. Results showed that nonLD children required fewer trials to learn the task and included more steps of the sequence on their first trial than LD children. Both LD and nonLD children required fewer trials and decreased the frequency of their errors over the 3-year period. When teaching the task to the puppet, nonLD children were found to be more verbally fluent, both qualitatively and

quantitatively, as well as more informative. Both LD and nonLD children increased their verbal production over time and initial differences in the number of wrong direction moves were not found at the end of the 3 year period. One criticism of this study is related to the task employed to measure listener skill. The learning of the puzzle box sequence required a number of component skills in addition to adequate listening. Poorer performance by LD children may reflect difficulties with one of these component skills rather than inadequate listener skills.

Children's ability to reformulate their messages in response to requests for more information was also assessed. All children were found to provide more new information to the puppet and demonstrate increased sensitivity to verbal cues of noncomprehension across the 3-year period. However, nonLD children exhibited a more dramatic increase in paraphrasing ability by the third year. This increase was speculated to be a developmental shift in awareness of the equal responsibility of speakers and listeners in communication. The authors suggested that deficits or delays in communicative competence by LD children may be due in part to differences in the information processing ability of these children.

These findings are consistent with those reported by Noel (1980), Spekman (1981), and Mathinos (1988) in showing LD children to be less effective communicators than nonLD children. However, the findings are inconsistent with respect to differences in listener versus speaker competence. This inconsistency may have resulted from differences in the complexity of the listener tasks from study to study.

Rather than an overall assessment of speaker and listener skills, a number of

studies (Donahue, Pearl, & Bryan, 1980; Hambrecht, 1987; Knight-Arest, 1984) have examined specific component skills of referential communication ability. For example, role-taking ability and skill at reformulating a message in response to requests for clarification were assessed by Knight-Arest (1984). She compared LD and nonLD boys, aged 10 to 13 years. The referential communication speaker task required children to teach the game of checkers to the experimenter. Results indicated that LD and nonLD boys differed significantly on their "level of response to verbal cues of confusion" (p. 241), with nonLD boys making more frequent and more helpful responses than LD boys. The author concluded that LD boys evidenced more difficulty than nonLD boys, delineating specific differences in language use and self-involvement between LD and nonLD boys. These findings are supported by a more recent study by Hambrecht (1987) who also compared the ability of 13- to 15-year old LD and nonLD boys to revise their messages following communication breakdown. Hambrecht (1987) concluded that the lower performance by LD children was reflective of both vocabulary limitations and egocentricity.

Donahue et al. (1980) examined LD children's ability to initiate the repair of a breakdown in communication and their understanding of the conversational rules necessary to undertake this task. A referential communication task was given to LD and nonLD children in grades 1 through 8 where subjects played the role of the listener and the experimenter played the role of the speaker. The speaker presented a message and asked the listener which one of the four pictures presented was being described. Messages were varied in terms of informativeness. The dependent variables were the number of requests for more information and

the number of correct referent choices made by each child. Results indicated both LD and younger children made fewer requests for information than nonLD and older children when given uninformative and partially informative messages. In addition, the mean number of requests made by LD children did not differ across the two types of inadequate messages whereas nonLD children were more likely to make requests when messages were uninformative, in contrast to partially informative. Since selection of the correct referent based on inadequate messages is dependent on requests for more information, it was not surprising to find that LD children made fewer correct choices than nonLD children when presented with inadequate messages. In contrast, LD and nonLD children did not differ in their ability to choose the correct referent when messages were informative, indicating that the deficit does not lie in their ability to select the correct referent when it is clearly specified. No differences were found with respect to response latency scores.

In an attempt to distinguish between an inability to appraise message adequacy (linguistic deficits) and an inability to request more information from a speaker who produces an ambiguous message, a second experiment was conducted. In this appraisal study, children were given a message and asked to judge whether another child (the imaginary listener) would be able to choose the correct referent based on the information presented. Children were given the same messages as in the previous task, with the same three levels of adequacy. A measure was again taken of the number of correct referent choices made by each child.

Overall, the results showed that this skill increased with age but that there

was no difference in the ability of LD and nonLD children to recognize inadequate messages. This suggests that LD children's failure to request more information was not the result of deficits in the language comprehension skills necessary for accurate appraisal of message adequacy. An examination of LD children's linguistic skills for requesting further information concerning the message further showed they were quite capable of this skill. The findings of this study suggest that LD children may be unaware of their obligation as listeners to actively work at providing feedback and requests for further information for repairing communication breakdown. Donahue et al. (1980) further suggest that LD children appear to show an unwillingness to assume conversational responsibility which may add to or produce the peer social rejection experienced by many of these children.

Although the research has not focused specifically on determining the age of acquisition of particular referential communication subskills in LD children, it has provided some insight as to how these children compare with nonLD children. Despite methodological differences between studies, the results suggest that LD children are less proficient than their nonLD peers in formulating as well as reformulating descriptions that are useful to their partners. One can speculate from the findings that the less adequate messages by LD children result from deficits in language production, and/or difficulties in assuming the perspective of their listener (Donahue et al., 1983).

Referential Communication Skills Training

From within the framework of developmental studies examining the nature of children's referential communication skills, a number of approaches have been developed to elicit or accelerate referential communication skills in children. One approach, namely role-taking, emphasizes making the relation between speaker and listener roles more salient, which can involve confronting speakers, while in their role, with the effects their message has on the listener. This is potentially effective for informing speakers of the difference between their position (knowledge, situation, etc.) and those of listeners, as well as showing speakers that there is a causal relationship between their message and what the listener can or does do.

Techniques in role-taking have also taken the form of having children reverse roles from speaker to listener and back. This is believed to provide children with the opportunity to experience the situation from each role, thus increasing their role-taking ability. Similarly, the child-as-third-party-observer method is potentially effective in that the relation between speaker and listener is more easily focused on by children when they are at an objective distance. Having children vicariously reverse roles in this observer position has also been recommended (Asher & Wigfield, 1981).

Another approach to training referential communication skills emphasizes the teaching of comparison activity. This technique is believed to be effective for ensuring that the message generated is more highly associated to the referent than it is to the nonreferent, thus increasing children's ability to differentiate between the two (Asher & Wigfield, 1981). Such an approach is therefore beneficial to both

the speaker, who must produce the message, and the listener, who must distinguish between the referent and the nonreferents.

Throughout the literature on referential communication skills training, studies have used these approaches either alone or in combination with each other. Asher and Wigfield (1981) noted in their review of training techniques that role-taking, in and of itself, has not been found to be a very effective method for developing children's referential communication skills. They advocate that the comparison approach has met with more success but that the integration of the two approaches is most effective for younger children. Once children have acquired the ability to make comparisons and, in turn, to recognize ambiguities in messages, teaching them to deal effectively with message ambiguity has been found to be the most successful approach.

More recent studies have employed the "confrontation" approach, focusing on specific speaker or listener skills independently (Cosgrove & Patterson, 1978; Robinson & Robinson, 1978; Whitehurst & Sonnenschein, 1981). The training programmes, although differing in specifics, generally include modelling appropriate behaviours and providing the child with instructions concerning the use of certain skills. Typically, the effects of this training have been found to last over time and transfer to other tasks of the same modality (Sonnenschein & Whitehurst, 1983).

A series of studies by Sonnenschein and Whitehurst (Sonnenschein & Whitehurst, 1983, 1984a, 1984b; Whitehurst & Sonnenschein, 1981), using the confrontation approach, emphasized the teaching of specific rules of communication rather than training of component skills. They employed a

technique of describing differences between the referent and its surrounding context known as the "difference rule feedback" method (Sonnenschein & Whitehurst, 1984b, p. 1936). Children were provided with different combinations of perceptual and communication instructions and feedback indicating whether or not their messages had specified how the referent and nonreferent differed. The results of their studies suggested that combining communication instructions (e.g., "Tell me about the triangle with the star above it (the referent) so that I know which triangle you are talking about"; Whitehurst & Sonnenschein, 1981, p. 132) with perceptual feedback combined (e.g., "That's good/wrong, you told/did not tell me how the triangle with the star above it was different from the other"; p. 133), was the most effective approach for improving performance on a referential communication task. Shantz (1981) stated that this combination was successful because it included both the goal of communication and the means to achieve it.

Shantz and Wilson (1972) also found that providing practice and feedback to 7- and 8-year olds improved their referential communication skills in comparison to control conditions, on both description and discrimination tasks. Children in the experimental condition received six 30-minute training sessions, where children served as speakers, listeners, and listener-observers. The experimenter actively questioned listeners and observers about message adequacy and encouraged their constructive criticism of the speaker's messages.

Robinson and Robinson (Robinson, 1981a, 1981b) also developed a series of confrontative techniques to elicit or accelerate children's understanding of the communicative process by improving their ability to recognize communication breakdown and the reasons for it. The emphasis of these techniques was on

explicitly questioning children about when and why their messages were not understood. Children, 5 and 6 years of age, served as speakers while the experimenter played the role of the listener in a task requiring the child to provide information to the experimenter such that both would end up with their dolls dressed in an identical manner. Both the speaker and the listener had a series of garments for their dolls which varied along a number of attributes. Children were also categorized as listener- or speaker-blamers, based on responses to a series of "whose fault" questions. When messages were ambiguous, for one-third of the children the experimenter responded with a guess, for another third the experimenter responded by asking "which one?", and for the remaining third the experimenter responded with explicit instructions regarding what was missing. The experimenter, in this last condition, made a choice only after she had elicited the missing information from the child. Providing explicit feedback was found to significantly decrease the number of ambiguous messages given by listener-blaming children compared to the other two feedback conditions. However, no difference was found between conditions for children who had more advanced understanding of the causes of communication breakdown (i.e., speaker-blamers). For a more detailed explanation see Robinson (1981b).

The types of explicit questioning used by Robinson (1981a, 1981b) have been documented and tested. For example, in the doll-dressing task, previously noted, a breakdown in communication was followed by children being asked a series of "whose fault" questions:

> We went wrong that time. Whose fault was that, mine or yours? Why? Did I/you tell you/me properly which one to pick? (If the child responds with 'no'), What should I/you have said? Whose fault was it we went wrong? Why? (Robinson, 1981b, p. 169).

Another task involved presenting children with a series of scenarios in which some children ask their mothers about some item they have misplaced. The message the child gives is always ambiguous and is followed by different responses from each mother including more or less explicit indicators of not understanding what the child has asked. After each recitation of dialogue, the child is asked two questions:

> _____'s mum knows _____ wants a _____. Does she know this is the one he wants? (pointing to a picture of the item). If the child says no, he/she is asked why not: "Did _____ say enough about what he wanted? He said "Mum, have you seen my _____ please? Did he say enough about what he wanted?" If the child said no, he is then asked "What should he have said? (Robinson, 1981b, pp. 178-179).

Using this line of questioning, the child is informed that their message is inadequate, by specifying the inadequacy and including a request for help. Like Sonnenschein and Whitehurst's (1984b) feedback it tells the speaker about success or failure of their message; unlike their type of feedback, it specifies the problem but not the means to solve it, such as making comparisons.

Cosgrove and Patterson (1978) compared the effectiveness of two techniques for improving the listener skills necessary for referential communication in first graders. Children were assigned to either a modelled training programme or a planned training programme or both. In the modelled intervention, children viewed a 3-minute videotape of an adult playing a referential communication-type game. The video showed the model stating aloud when he/she did not have enough information to choose the appropriate referent, and then asking for more information from the speaker. In the planned intervention, children were given the suggestion that when they were unsure of the correct referent, they should ask questions to help them figure out the appropriate response. In terms of immediate

effects, the findings showed that children in either training programme asked significantly more questions than those in the control group, but did not differ in terms of the number of correct referents chosen. With respect to delayed effects, 2 or 3 days after training the experimental groups still asked more questions than controls, and were also able to select more correct referents. No differences were found between children who received both interventions and those who received either the modelled or the planned procedures, indicating a lack of compounded effects for the two interventions. The authors concluded that young children can be taught listener skills for effective referential communication.

Unfortunately, research on the training of referential communication skills has focused almost exclusively on normally-achieving children, thus the effectiveness of these approaches for LD children is largely unknown. One exception is a study by Donahue (1984) in which she attempted to increase the referential communication listener skills of fourth through sixth grade LD and nonLD children using a question-asking strategy. All children were first pretested using a task of four pictures differing on four dimensions, in order to vary the informational adequacy of descriptions. Following testing, those children who produced the minimal number of requests for clarification were selected to participate in the intervention phase of the study. These children were randomly assigned to either an experimental or control condition. Children in the experimental condition were taught the "20 Questions Game", in which they were to guess which of 35 pictures of animals and objects the experimenter was thinking of by asking questions requiring "yes" or "no" responses. In contrast, children in the control condition played TicTacToe for the same amount of time.

In terms of differences between LD and nonLD children, fourth grade and LD children were found to produce fewer requests for clarification and made fewer correct choices than fifth grade and nonLD children when messages were partially informative and uninformative. With respect to the effects of the intervention, the results indicated that by playing two games of 20 questions children did not increase their production of requests for clarification in comparison to the control group. The authors argued that perhaps the 20 questions task was not sufficiently similar to the referential communication task used to assess performance so as to promote the transfer of skills from one to the other. They also noted that the performance of the LD children was similar to that of younger nonLD children, suggesting that LD children experience a lag in their ability to speak and listen referentially.

In contrast to the ineffectiveness of the 20 questions game, evidenced by Donahue (1984), Courage (1989) found this technique to be successful at accelerating the referential communication skills of 5- to 7-year old nonLD children. Perhaps, then, this particular technique is effective, but the limited training (2 games) provided in the study by Donahue (1984) was the reason for its apparent ineffectiveness. Unfortunately, the small sample size of the study by Donahue (1984) made it difficult to examine differences between LD and nonLD in response to the intervention.

Research on referential communication training demonstrates that these skills can be improved with training. The findings further suggest that the techniques which emphasize teaching the rules for communication have been more successful than approaches which emphasize training of component referential

communication skills. Unfortunately, the one study which did attempt to train LD children did not prove to be successful.

To date only one study has directly examined the effects of referential communication training on social status. Galutira (1985) provided a 6-week training programme in referential communication to developmentally delayed 7- to 9-year-olds, comparing their performance to that of an attention control and a no treatment control. Each week the treatment group received training in referential communication skills adapted from a number of previous studies. The attention control group, in contrast, engaged in playing various educationally-oriented games. Results indicated a significant improvement by the treatment group in referential communication abilities, which was maintained at 2-month follow-up. Significant increases by this group, in comparison to both control groups, on ratings by unfamiliar peers and teacher ratings of acceptance, were also found at follow-up. These results offer encouragement for future programmes designed to improve social status in both developmentally delayed and other populations. In addition, such findings shed some light on the relationship between referential communication skills and social status.

Interpersonal Problem-Solving

Interpersonal problem-solving is one specific dimension of social competence which has been correlated with emotional and behavioural adjustment in various populations (Tisdelle & St. Lawrence, 1986). Difficulties with interpersonal problem-solving have been found to be related to negative evaluations by peers (Asarnow & Callan, 1985).

Interpersonal problem-solving in its broadest form can be defined as a process

involving complex skills to gather and process information from a total social field and to develop from this information an interpersonal response appropriate to the situation. In its most basic form this involves the following skills: interpersonal sensitivity, recognizing and identifying others' feelings, recognizing problems and generating alternative solutions to them, anticipating consequences and obstacles associated with a given solution, and using means-end planning to reach specified goals (Weissberg & Gesten, 1982). Research is far from conclusive concerning which skills are most critical to particular situations or developmental stages (Elias, Rothbaum, & Gara, 1986). From the findings of a study by White and Blackham (1985), the period between second and sixth grades is suggested as being particularly important for the development of these abilities.

In particular, LD children have been found to show deficits in interpersonal problem-solving which has been suggested to be one of the causes of their rejected status by peers. Silver and Young (1985) explored the social problem-solving abilities, peer status, and behavioural adjustment of LD, and normally- and low-achieving nonLD eighth graders. For the purposes of this study, low-achievers referred to children of similar academic functioning as the LD children in one or more areas of reading or math (below grade level) but with no discrepancy in achievement and ability levels. Measures used for assessing these children included three scales of problem-solving ability: the Social Interaction Role Play Assessment (SIRPA) for adolescents, the Means-End Problem-Solving procedure (MEPS), and the Awareness of Consequences test. In addition, the Behaviour Rating Profile (BRP), measuring self-ratings of behaviour adjustment and peer acceptance, and a peer sociometric rating scale called the Junior High Class Play

(JHCP) were also administered.

Results indicated significant differences between groups on the SIRPA, the MEPS, and the Awareness of Consequences test but not on the BRP. More specifically, normally-achieving nonLD children showed the highest scores on all these measures, while no significant differences were found between low-achieving and LD children. These results indicate that LD and low-achieving children demonstrated about the same skill in interpersonal situations despite the significantly lower mean I.Q. scores of the low-achieving group. When the effects of I.Q. were covaried out for all the measures, significant differences were reported between low-achieving and LD children on the Awareness of Consequences test and the SIRPA - part B (multiple-choice responding) measures only. Significant differences were found between LD and nonLD (both low- and normally-achieving) on the JHCP measure, where nonLD peers received the fewest negative ratings on the sociability-leadership and aggressive-disruptive dimensions. The authors concluded that their findings offer support for the theory that LD children are significantly poorer than normally-achieving children with respect to their problem-solving abilities, although they were not different from low-achievers. As well, they concluded that LD children, in contrast to both the high- and low-achieving nonLD children, were of a lower status socially (Silver & Young, 1985).

According to Elardo and Caldwell (1979), a number of theorists have suggested that peer interactions are important and necessary for the development of problem-solving skills because they lead to conflicts which force the individual to re-organize their cognitive structures and make qualitative changes in order to

understand themselves and others. Should this be the case, then low social status, if associated with fewer interactions, may well contribute to the cause and maintenance of deficits in problem-solving. As a result, it is of importance to develop effective programmes for enhancing problem-solving abilities and perhaps in turn improving social status.

Interpersonal Problem-Solving Skills Training

Interpersonal problem-solving skills training programmes emphasize cognitive processes and their relationship to behavioural adjustment. In general, they place greater emphasis on adaptive thinking processes in contrast to training discrete behavioural responses to various interpersonal situations. Covert thinking processes "...mediate behavioural adaptation by making available to the individual a repertoire of potentially effective response alternatives for managing problems and increasing the probability of choosing an effective alternative" (Yu, Harris, Solovitz, & Franklin, 1986, p.30).

Although there are a number of interpersonal problem-solving abilities identified and investigated in the literature, three in particular have been found to bear the most consistent relationship to measures of social adjustment: alternative thinking, the ability to generate multiple potential solutions to a given problem; consequential thinking, the ability to foresee both immediate and long-term consequences of a particular problem; and means-end thinking, the ability to plan a series of specific actions, to recognize potential obstacles to reaching a goal, and to use a realistic time framework for reaching a goal. The majority of the research on interpersonal problem-solving has focused on the training of these three skills or minor variations of them. For a more extensive review of the

research on interpersonal problem-solving consult Urbain and Kendall (1980).

The most frequently cited research in interpersonal problem-solving training for children is that of Spivack and Shure and their colleagues (Shure & Spivack, 1972, 1979; Spivack, Platt, & Shure, 1976; Spivack & Shure, 1974). They designed a programme for training preschool children in interpersonal cognitive problem-solving (ICPS) skills which was later adapted for use with other age groups and populations. Their programme involves 46 lessons, activities, and games which are coordinated by the classroom teacher in daily lessons of 20-30 minutes during which skills are taught through the use of hypothetical and actual interpersonal problem situations. Lesson content is divided into three sequential parts: enumerating solutions only, enumerating consequences only, and then pairing specific solutions with specific consequences. The authors have published numerous studies in which this approach has been found to be effective for improving children's ability to generate relevant means for arriving at a desirable outcome (means-end thinking) as well as alternative solutions from which to choose in solving problems.

A project by Elardo and Caldwell (1979) examined the effects of a similar problem-solving intervention programme with fourth- and fifth-graders. The programme, entitled "Project Aware", was designed to increase respect and concern for oneself and others through the acceptance of individual differences and the understanding of the thoughts and feelings of others. It focused on training children to solve interpersonal problems through defining the problem(s), suggesting alternative solutions and recognizing the consequences of these solutions for all people involved. An in-service training programme was also

developed for teachers in order for them to act as models of the appropriate attitudes and skills. The classroom programme lasted 7 months with two sessions per week. Measures were taken of role-taking ability, classroom adjustment, and ability to generate alternative solutions to a structured series of stories about problem situations.

The results indicated a number of significant differences between groups. The intervention group showed more growth in terms of respect and concern for others, and produced more alternative solutions to a given story than the control group. Unfortunately, these findings are less impressive in light of the many problems in the experimental design of the study. For example, the two groups were taken from different schools making it difficult to conclude that the findings were due solely to the intervention. In addition, the measure on which most of the differences were found was teacher ratings where teachers were aware of the group membership of each child.

Despite extensive research on treatment approaches in the area of social and interpersonal problem-solving, very little of it has been focused on improving social status. One study which did examine the effects of such an intervention on social status was that by Weissberg et al. (1981). Their training programme involved a highly structured curriculum, presented three times a week for 14 weeks, involving role-playing, videotape modelling, class discussions, and workbook materials. Three problem-solving measures, including a structured interview, and two adjustment scales (a behaviour rating scale and a sociometric measure) were administered to randomly selected children in grades 2 to 4.

As hypothesized, children given training improved significantly more on the

problem-solving tasks than controls, offering significantly more solutions to problems and requiring less prompting from adults. Teacher ratings indicated more improvement by the experimental group with respect to shy-anxious behaviours, competence, global likability, and global school adjustment. Unfortunately, peer sociometric ratings failed to indicate significant group differences. Although the programme was effective for improving problem-solving and adjustment scores (as measured by the teacher ratings), the authors offered no suggestions as to why sociometric status did not also improve. It may well be that such a measure is not sensitive enough to reflect this initial improvement, especially since social status is relatively stable across time and situation, and a follow-up assessment was not done. Had follow-up measures been taken perhaps the success of this intervention would have also been reflected in peer ratings. The findings are consistent with that reported by Yu et al. (1986) who employed the same programme with 7- to 12-year old psychiatric patients.

Chandler, Weissberg, Cowen, and Guare (1984) conducted a 2- to 5-year follow-up study of a number of referred children who had previously participated in the programme. A comparison sample of nonreferred children, who had not participated in the programme, and a group of children identified by teachers as being the least well-adjusted children in their class served as control groups. The results indicated that treated children maintained their skills at follow-up, especially on teacher ratings. As expected, compared with the nonreferred children, the treated group was not as well-adjusted based on teacher ratings and ratings of perceived competence. However, the performance of the treated group was found to be better than that of children identified as least well-adjusted.

Therefore, although the programme did not succeed entirely in overcoming serious adjustment problems, it did reduce the risk for an initially highly vulnerable group of developing further adjustment problems.

A more recent study by Nelson and Carson (1988) hypothesized that children in grades 3 and 4 who received social problem-solving training would, among other things, show more positive changes in self-efficacy and peer acceptance than controls. Their training programme involved one session, 1 hour per week for 18 weeks, which was divided up into three equal parts. The lessons focused on understanding and recognizing feelings, specific behaviours for friendship making and getting along with peers, and social problem-solving skills. A social skills knowledge test, a social skills role play test, a child behaviour rating scale, a self-efficacy measure for peer interactions, and peer nomination ratings were all used as dependent measures.

Results indicated main effects of group on measures of social skills knowledge and performance (role playing) where the experimental group showed overall significant increases from pretest to posttest in comparison to controls. Contrary to expectation, a significant main effect of group for third-graders was reported in which the experimental group showed increases in problem behaviour and self-efficacy, and decreases in peer acceptance. When the results of these same measures were considered for the fourth graders however, the experimental group showed increases in competence and self-efficacy. The authors noted that such mixed results are likely to be reflective of a difficult third grade class and an uncooperative teacher, noting the importance of the classroom context in determining outcome. The authors noted that such mixed results have also been

reported by Gesten et al. (1982) and Weissberg et al. (1981).

A second phase of the research involved training in social problem-solving similar to that described by Weissberg et al. (1981). The same measures and grade levels were used as in the previous phase. Despite efforts to improve upon the initial programme, the experimental group showed improvement in social problem-solving skills but not in self-efficacy, behavioural adjustment or peer acceptance. The authors concluded from this that the overall results failed to support the utility of social problem-solving training for improving such skills.

The majority of the studies thus far have been implemented over an entire school year. Treatment spanned over a longer time period allows children the opportunity to practice the skills as they are learning them. Condensing such a programme into a few weeks would certainly be a more effective use of time but also runs the risk of being ineffective. Stiefvater, Kurdek, and Allik (1986) examined the effectiveness of a condensed 5-week classroom-based problem-solving programme on children of differing social status. Popular, average, rejected, and neglected fourth grade children were identified using measures of positive and negative peer nominations. Post-treatment results indicated that the treatment group had significantly better scores than children in the control group with respect to generating alternative solutions and consequences.

With respect to social status differences, rejected children showed significantly lower scores at post-treatment on the means-end thinking measure and had more irrelevant solutions to problems than popular, average, and neglected children. However, all categories of social status were found to be equally affected by the treatment. The authors concluded that their programme was successful in

improving the problem-solving skills of fourth graders in a limited time period.

A study by Hazel, Schumaker, Sherman, and Sheldon (1982) was one of the few studies to examine the efficacy of a social and problem-solving skills training programme on LD children. Their programme, entailing 2 hours weekly for 10 weeks, focused on social skills training as well as interpersonal problem-solving skills training. Learning disabled, nonLD and court-adjudicate (JD) 13- to 15-year-olds, selected because of behaviour problems, all received the same treatment with multiple baseline measures assessing change over time. Behavioural role-playing was used to assess the effects of the treatment on five social skills, and problem-solving ability which was based on the generation and evaluation of alternative solutions to problem situations. The results indicated that all groups showed improvement in social skills following treatment, and the LD group appeared to acquire the skills at the same rate and to the same levels as the other groups. On the problem-solving measure LD children showed improvement but not to the same degree as the other two groups. For example, the LD group learned the problem-solving skill to an average level of 59% in comparison to 75% and 78% for the nonLD and JD groups, respectively. This finding, in contrast to the results of the social skills, was suggested by the authors as reflecting the possibility of specific cognitive processing deficits in LD children rather than general social skills deficits.

Overall, the majority of the research aimed at improving children's interpersonal problem-solving skills has met with some success. Unfortunately, this success was not noted in the one study which trained LD children in interpersonal problem-solving skills. In addition, the effectiveness of the interpersonal problem-

solving training programmes for improving social status has yet to be thoroughly explored.

The Present Study

Evidence indicates that children's referential communication and interpersonal problem-solving skills are related to their level of peer acceptance. As a result of the importance of peer relations to social self-concept as well as later social adjustment, it seems reasonable to assume that children at risk for peer rejection, such as LD children, require intervention. Studies on both referential communication and interpersonal problem-solving skills training suggest that these programmes have met with relative success in improving the performance of nonLD children, and at least in one study of referential communication, LD children.

The first objective of the present study was to further examine the relationships between referential communication and social status, and interpersonal problem-solving and social status. Whereas the majority of the research on referential communication and interpersonal problem-solving skills training have focused on nonLD children, the present investigation examined their effects on LD children, a population which is socially, behaviourally, and cognitively different from nonLD children. Although there are a number of different types of learning disabilities, those involving reading (i.e., reading recognition and reading comprehension) were specifically chosen for examination, since deficits in this area are perhaps the most debilitating due to the central role reading plays in school learning, encompassing most, if not all, subject areas.

The second objective was to investigate, given certain time restraints, which

programme, referential communication or interpersonal problem-solving, would be most beneficial for improving the social status and social self-concept of rejected LD children. The time restriction is an important variable to be considered given that most services are not able to afford long-term programmes.

The present investigation, therefore, set out to test a series of hypotheses. It was predicted that referential communication and/or interpersonal problem-solving skills would improve with training, where improvement was expected only on those measures for which the particular group had been trained. In other words, performance on the referential communication measures was expected to increase only for those children who received training in referential communication skills. Similarly, performance scores on the interpersonal problem-solving measures, was expected to improve only for children who were trained in interpersonal problem-solving skills. It was also hypothesized that any improvements due to training would in turn generalize to improvements in social status and social self-concept.

Social status was assessed by two means: peer ratings and teacher ratings. Since the literature supports the use of peer ratings in assessing social status, positive and negative peer nominations and roster rating measures were employed for this purpose. Given the relative stability of social status across situations (Coie & Dodge, 1983), these sociometric ratings were made by unfamiliar peers. In fact, the research shows that this is an effective method of evaluating peer status (Dodge, 1983; Putallaz, 1983). The use of unfamiliar peers is believed to be especially important in the assessment of LD children due to the possible stigma associated with differences in academic abilities, a variable correlated with social

status (Coie & Krehbeil, 1984). Unfamiliar peers are likely to have little or no knowledge of LD children's academic standing.

The use of a teacher rating scale, in addition to peer ratings, allowed for an easily obtainable assessment of children's social status in the classroom. This measure provided information concerning the generalization of improvement in social status from the intervention programmes.

Method

Subjects

Children between the ages of 9 and 12 years (grades 3-6) participated in the study. Some of these children were selected from the files of the Diagnostic and Remedial Unit of Memorial University of Newfoundland, to which children are referred for difficulties in reading and other academic problems. Other children were selected by contacting school counsellors and special education teachers of various schools in the St. John's area. All children selected had to meet the following criteria for inclusion in the study:

1) Both verbal and performance scores on the Weschler Intelligence Scale for Children-Revised (WISC-R; Weschler, 1974) had to fall within or above the average range.

2) Performance on either the Slosson Oral Reading Test (SORT; Slosson, 1963) or the reading recognition and/or comprehension subscales of the Peabody Individualized Achievement Test (PIAT; Dunn & Markwardt, 1970) had to be at least 1 year below expected grade level, based on age, for children of normal I.Q., and at least 6 months below expected grade level, based on age, for children of above average I.Q. This criterion is in accordance with that suggested by Hornsby (1984). In contrast, performance on the general information and math subscales of the PIAT both had to fall within the normal range for the child's expected grade level.

3) A rating above the 80th percentile on the unpopularity subscale of the Achenbach Child Behaviour Checklist - Teacher Form (CBCL) was also required (Achenbach & Edelbrock, 1986).

4) The learning problems had to have been diagnosed prior to any evidence of behaviour problems. However, other problems, namely behavioural and/or social/emotional problems, could occur concomitantly with the learning disability.

5) An absence of any other handicapping condition was also necessary.

Of the 22 children whose parents were interested, only 12, 9 males and 3 females, met all five criteria. The remaining children's scores on the CBCL did not meet the specified criterion. With the provision that each group be comprised of three males and one female, children were randomly assigned, using a table of random numbers, to one of three treatment groups: referential communication training, interpersonal problem-solving training, or attention control. However, reassignment of some children was necessary due to scheduling difficulties. Both parents and teachers were blind as to group membership of individual children.

Materials

Criterion Measures

I. Weschler Intelligence Test for Children-Revised: In addition to being a well-known and well-documented measure of intelligence in children of this age, the WISC-R is a standard part of educational assessments performed at the Diagnostic and Remedial Unit. This measure has been found to have a low standard error of measurement (Goldman, Stein, & Guerry, 1983). It consists of 10 subtests - five verbal and five performance - which allow for the identification

and exclusion of children who are developmentally delayed or who have wide-scale language problems characterized by significant differences between verbal and performance scores (Weschler, 1974). The measure was used to assess performance across groups since social cognition and competence have been found to be correlated with I.Q. scores (Pellegrini, 1985).

II. Slosson Oral Reading Test: This is an individually administered test which assesses children's ability to read words aloud at different levels of difficulty (Slosson, 1963). It is composed of 10 lists of 20 words each, taken from standardized school readers, which the child reads to the examiner. Slosson (1963) reported a 1-week reliability coefficient of .99. Several studies reviewed by Cohen and Cohen (1985) have demonstrated the validity of the SORT using various standardized reading mastery and readiness tests.

III. Peabody Individualized Achievement Test: This measure is designed to assess academic achievement in the areas of mental arithmetic, reading comprehension, reading recognition, spelling, and general knowledge of the world. It is an untimed test, presented in a multiple-choice format, and is a standard part of an academic assessment at the Diagnostic and Remedial Unit. This measure also provides both age and grade equivalents as well as percentile and standard scores for each subscale (Dunn & Markwardt, 1970). It was selected for the identification of children with achievement deficits in the areas of reading comprehension and/or recognition but whose performance on the math and general information subscales were at grade level.

For 1 month test-retest reliability, a median coefficient of .78 was reported by Goldman et al. (1983) for this measure with the highest values being found for the

total test (r=.89) and the reading recognition subscale (r=.89). A study by Baum (1975) assessing the validity of the PIAT reported a correlation coefficient of .78 (ranging from .56 to .90) between the PIAT reading recognition and reading comprehension, and the reading subtest of the Wide Range Achievement Test. Wettler and French (1973), who examined the performance of LD children on the PIAT, concluded it to be an effective screening measure for this population.

IV. Achenbach Child Behaviour Checklist - Teacher Report Form (CBCL): This widely used measure designed by Achenbach and Edelbrock (1978) consists of 188 items related to classroom behaviour scored by teachers on a 4-point scale. It yields a measure of school performance and adaptive functioning as well as scores on various behaviour problem scales, one of which assesses perceived unpopularity.

Achenbach and Edelbrock (1986), using ratings by teachers of learning disabled pupils, reported median test-retest reliability correlations of .74 for a 2-month interval and .68 for a 4-month interval. Inter-teacher agreement on the unpopularity scale ranged from .54 to .75 (median r=.60). This subscale has also been found to have high construct validity (r=.60) when correlated with the Connors Revised Teacher Rating Scale.

Since teacher ratings have been found to be positively correlated with peer sociometric ratings (Landau, Milich & Whitten, 1984; Monson, Greenspan, & Simeonsson, 1979; Roff et al., 1972), the checklist was sent to teachers of target children to obtain a measure of social status with familiar peers in the classroom. Analysis of post-treatment and follow-up t-score values on this measure helped determine whether the effects of the intervention programmes were generalizable

to the regular classroom. Therefore, for the purposes of the present study, this measure was used both as a criterion and as a dependent measure.

V. Blishen Scale of Socioeconomic Status: A measure of socioeconomic status (SES) was also taken using Blishen's scale (Blishen & McRoberts, 1976) since this variable has been found to be highly correlated with social cognition and competence (Pellegrini, 1985). The Blishen scale was developed for Canadian samples and takes into consideration income as well as educational level. The socioeconomic index of each family was arrived at by using the occupation of the parent with the highest rank when both parents were employed.

Dependent Measures

Of the eight dependent measures, two referential communication and two interpersonal problem-solving tasks served as primary dependent measures to assess the direct effects of the treatment programmes. The indirect or secondary effects of the treatment programmes were assessed using measures of self-concept and social status which are referred to as secondary dependent measures.

Primary Measures

Referential Communication Tasks: This measure is divided into two phases: a *speaker* and a *listener* task, both of which are administered individually. Both phases involve a series of 16 blocks, varying on two dimensions of four attributes: shape (square, circle); colour (yellow, blue); size (big, small); and width (thick, thin).

Speaker Task. In this phase, designed after Spekman (1978), children were given a series of three designs, using eight of the shapes, and asked to describe them in such a way that another child, not present, could reproduce them. Kossan

and Markman (1981) found that not having the listener present resulted in more effective messages produced by the speaker. Instructions for the task and examples of the designs used are provided in Appendix A. Different designs were used at post-treatment and at follow-up. This untimed test required children to identify the four attributes of each shape, together with its spatial orientation. Scoring procedures are described in Appendix B.

Listener Task. On this measure, designed after Courage (1989) and Donahue et al. (1980), children were given a series of 10 messages presented by the experimenter. Messages were made to range from totally informative to totally uninformative by randomly varying the number of attributes specified. Children were to ask the experimenter questions in order to identify the correct referent. Details of the procedure are provided in Appendix C.

Interpersonal Problem-Solving Measures: These measures include the means-end thinking and the multiple consequences tasks, both of which were designed by Spivack and his colleagues (Spivack, Shure, & Platt, 1985; Shure & Spivack, 1985). These individually administered tasks involve a series of three scenarios about peer relations all of which were used at the three testing periods.

Means-End Problem-Solving (MEPS): This instrument, designed by Spivack, Shure, and Platt (1985), provides a measure of the child's ability to "orient to and conceptualize means of moving towards a goal" (Silver & Young, 1985, p.208). This is assessed by presenting children with a scenario for which they are to provide a story. Stories are scored using guidelines outlined in the test manual, according to the number of relevant means generated that are instrumental in obtaining a desired goal, obstacles that might be encountered along the way, and

indications of time made in reaching the goal. Appendix D provides descriptions of the scenarios used.

Multiple Consequences Test (M-Con): This instrument is used to assess a child's ability to conceptualize multiple effects of interpersonal acts (Shure & Spivack, 1985). Children are presented with scenarios in which a hypothetical child is faced with a temptation situation. The child must indicate what the person is thinking before he/she decides what to do, and what happens after that. The scenarios are scored using guidelines outlined in the test manual, according to the number of different but relevant statements made that concern weighing the pros and cons, out of a possible 10 verbalizations for each scenario. This measure has been reported to have a test-retest reliability of .72 (Shure & Spivack, 1985). Appendix E contains descriptions of the scenarios used.

Secondary Dependent Measures

"What I Am Like" Scale: This 36-item scale designed by Harter (1982) provides a profile of the elementary school child's own perceived competence on four domains: cognitive, physical, social, and general self-worth. Items are scored on 4-point scales ranging from 1, low-perceived competence, to 4, high-perceived competence. The measure was constructed so as to minimize the influence of socially desirable responding. Because the interventions were expected to influence children's feelings of competence in the context of the social situation, only this subscale was analyzed. Test-retest reliability, for the social domain only, over a 9-month period was reported by Harter (1982) as .87 for a Colorado sample, and .80 for a New York sample. In terms of convergent validity, the social subscale was found to be moderately correlated (r=.59) with the roster-and-rating scale

developed by Roistacher (1974).

Sociometric Measures: The following measures were used to assess the effects of the training programmes on social status.

Positive Peer Nomination Scale: This measure, developed by Moreno (1934; cited in Asher & Hymel, 1981), requires children to nominate other children in their class, or some specified group, according to a specified interpersonal criterion. This scale yields a measure of the child's social network as it relates to real life instances (i.e., who the child would actually play with). According to Asher and Hymel (1981), the test-retest reliability of the positive nomination measure was found to be .52 over a 1-year period, and .42 over 2 years.

Negative Peer Nomination Scale: This scale is similar to the positive peer nominations but provides a measure of the extent to which children are disliked by peers. Used in combination with the positive peer nominations, they serve to differentiate neglected and rejected children. According to Roff et al. (1972), the test-retest reliability of this rating was .38 for 1 year, and .34 over 2 years.

Roster-Rating Scale: This measure, designed after Roistacher (1974), involves giving each child a random list of the names (and photographs in the case of younger or unfamiliar peers) of children in a specified group. Each child is asked to rank order the other children in the group using a Likert scale, in response to specified questions such as "How much would you like to play ball with _____?" or "How much would you like to ride on the school bus with _____?". This measure yields a rating of each child's popularity by peers in different situations. Oden and Asher (1977) reported six-month test-retest reliabilities of .82 and .84 (median correlations) for the "play with" and "work with" scales, respectively.

Procedure

The study employed a 2-factor design (group X time of testing) with repeated measures on one-factor. There were two treatment conditions, referential communication, and interpersonal problem-solving, and an attention control condition. All three groups were tested at pretreatment, post-treatment, and 2-month follow-up.

Pretreatment Testing

Preliminary assessment of intelligence and academic achievement was available from files at the Diagnostic and Remedial Unit. Parents of children who met these criteria were contacted by telephone and informed of the study. Interested parents met with the experimenter and were informed of the need for their child's teacher to complete the CBCL and return it to the experimenter in order to meet the criteria for inclusion in the study. A measure of SES was also obtained at that time, from information gained through a questionnaire on the parent and child's background (Appendix F). Upon meeting all five requirements of the study, informed consent forms (Appendix G) were signed by parents and each child was seen individually for a 1- to 1 1/2-hour session for assessment of referential communication abilities, interpersonal problem-solving skills, and self-concept. The measures where administered in the following order: the referential communication speaker and listener tasks, the "What I Am Like Scale", the M-Con test, and the MEPS test. This order of presentation was chosen specifically to prevent the child from becoming disinterested. The scenarios for the two problem-solving measures were administered in a predetermined random order. An audio recorder was used to record the child's responses to the referential

communication speaker task. These were later transcribed into written form and scored by an independent rater.

Sociometric Ratings with Unfamiliar Peers

Children were seen a second time, prior to implementation of the intervention, in order to assess their social status. Due to the possible stigma associated with the academic performance LD children, as well as the finding by Bryan (1976) that a child's basis for liking or disliking is fairly well-established by grade 4 or 5, a measure of familiar peers in the classroom may not be sensitive enough to changes in social status. Therefore, these measures of social status were administered to peers whose only knowledge of the target children was derived from interactions during a 1 1/2 hour playgroup.

The files of the Diagnostic and Remedial Unit were searched to obtain names of children in the same age range and gender as the groups of target children to serve as unfamiliar peers. This included children who had been referred to the unit for educational problems at some time, but who were not characterized as learning disabled. In addition, some of the children who became involved as nontarget children did so as a result of their parents' informal knowledge of the study. Same-gender groups were used because of consistent evidence of a difference between same-sex and mixed-sex interactions (Hartup, 1983). Therefore, one boy from each of the three treatment groups was randomly assigned to one of three new groups, making sure that none of the children in these groups attended the same school. The three girls, one from each treatment group, made up the fourth group.

The parents of nontarget children (unfamiliar peers) were contacted by

telephone and informed of a study being conducted on the development of children's friendships. Interested parents brought their children to the Psychology Clinic for a 1 1/2 hour scheduled playgroup.

Each playgroup therefore, was composed of one target child from each group and a number of nontarget children. Although an attempt was made to ensure that there were 10 children in each playgroup, the size of the groups varied because some of the children scheduled to take part did not attend. Upon arrival at the Psychology Clinic, an individual photograph of each child was taken for use in the sociometric measures. The playgroup was structured in a similar manner to those described by Dodge (1983) and Galutira (1985). The first 20 minutes of the 1 hour session was structured by the experimenter in terms of games and crafts (i.e., cut-outs, drawing, etc.). The middle 20 minutes involved the children working together on an academic task ("Spello"), and the last 20 minutes was used for free play in which the children had available to them a variety of other toys and games. During the remaining 30 minutes, each child was taken out of the playroom individually to a separate room where they were asked to fill out the peer rating measures for unfamiliar peers.

Positive and Negative Peer Nomination Scales. Children were told that the experimenter was interested in knowing which children they liked in the playgroup. Using the photographs, each child was asked to nominate the three children in their playgroup they would most like to come back and play with. As well, children were asked to name one child whom they would least like to come back and play with. Separate scores for each measure were derived by assigning one point to a child each time their name appeared in a category. The sum of the

points in each category was then divided by the number of children in a given playgroup, since the playgroups were of unequal numbers. Therefore, a positive and a negative nomination score was derived for each child.

Roster-Rating Scale. Each child was then given a random list of the names and photographs of the other peers in their playgroup (both target and non-target children). They were taught to use a 3-point Likert scale (0=not at all and 3=very much), and asked to rank order the children in response to the following question: "How much do you like playing with _____?". Scores were derived by summing the number of ratings given to a particular child and dividing this by the number of children in the playgroup. This yielded a mean score between 0 and 3.

Intervention Programmes

Following pretreatment testing procedures, each of the three treatment groups met 1 1/2 hours per week for 6 weeks. The two treatment groups worked on assigned training tasks for a total of 70 minutes. During the remaining 20 minutes of the session, children were provided with a game to play as a reward if tasks were completed. In contrast, the attention control group played with the games provided for them during the entire 1 1/2 hour period. Various sections of the training programmes were first pilot-tested in order to evaluate their appropriateness with this population and age group.

Referential Communication Training. This programme involved training children to be effective listeners and speakers by means of a series of referential communication tasks used in previous training programmes. As speakers, children were taught to identify distinctive features of referents, recognize cues from the

listener concerning communication breakdown, re-adjust their message to make it less ambiguous to the listener, and enhance their perspective-taking skills. As listeners, children were taught to appraise the value of the information in the messages, to use efficient questioning skills when messages were ambiguous, as well as to coordinate the information presented to them appropriately so that the correct referent would be identified. See Appendix H for an outline of the treatment sessions.

Interpersonal Problem-Solving Training. This programme was modelled after the intervention strategies of Spivack et al. (1976). Children were taught through a series of role-playing games, modelling, corrective feedback, and social reinforcement. Content included learning to recognize the feelings of self and others, and the problems that occur between people; understanding that there are different ways to solve problems and different solutions that can be chosen; and recognizing what possible consequences may be associated with the various solutions, and choosing the one with the most positive outcome. See Appendix I for a more extensive outline of the sessions.

Attention Control. This group involved having children play a number of educational games including those of reading comprehension, spelling, word categories, and memory, as well as drawing tasks and puzzles. It was designed to control for the effects of interaction with a group of peers and the attention generated from being in an intervention programme. See Appendix J for an outline of the sessions.

Post-treatment and Follow-Up

Following the six week intervention, children were again tested using the same dependent measures as at pretreatment testing in order to examine the effects of the treatment programmes on children's performance. Due to the limited number of interpersonal problem-solving tasks available, the same scenarios were used at each testing period. In contrast, for the referential communication speaker and listener tasks, different designs and referents were used at each testing. For subjects' sociometric ratings by unfamiliar peers, the composition of children in the playgroups was varied for each testing period to ensure that previous acquaintance would not affect the ratings. In addition, the CBCL was again sent to teachers of target children to assess the effects of the intervention programmes on classroom behaviour. A similar testing procedure was again administered to children at a 2-month follow-up, using the same measures.

Results

All data analyses were performed using the SPSS-X statistical package with significance levels set at $p<.05$. Post hoc analyses were done using Scheffé tests. Following a preliminary analysis of pretreatment scores, to ensure no differences between groups on criterion and dependent measures, a series of ANOVAs for repeated measures were performed. In order to compare the effectiveness of the three treatment groups, ANOVAs using difference scores were further conducted on primary dependent measures only. A series of correlations were then done to assess the relationship between increases in performance on primary and secondary measures. Chi square analyses were also conducted to examine the group membership of those subjects who showed improvement. Finally, a nonstatistical examination of the social status measures was performed in an attempt to gain a greater understanding of possible changes in social status categories as a result of the intervention. Appendix K contains the raw scores of each subject on all measures at each assessment period.

Interrater Reliability

Due to the possibility of subjective interpretation of the scoring procedures of the referential communication speaker task and the two interpersonal problem-solving measures, the MEPS and the M-Con, it was necessary to establish interrater reliability. Transcripts from these measures were scored in their entirety by the experimenter and a reliability check was done by a trained

independent rater, who was blind as to group membership and time of testing. Interrater reliability of the tasks was assessed using two segments for each subject (i.e., designs, stories, or problem situations) which amounted to 22% of the data. For the speaker task, a Pearson Product Moment Correlation (PPMC) of .92 was found. The MEPS and the M-Con measures yielded PPMCs of .84 and .78, respectively. The percentage of agreement within one point was assessed to further determine consistency across raters. For both the MEPS and the M-Con measures, interrater agreement was found to be 96%. All of these statistics were found to be significant at $p < .005$.

Preliminary Analysis Of Pretreatment Scores

A series of univariate F-tests were performed to ensure that groups did not differ on criterion measures. Results indicated no significant differences for age, $F(2, 6) = 0.95$, SES, $F(2, 6) = 0.32$, teacher ratings, $F(2, 6) = 3.10$, grade, $F(2, 6) = 0.25$, I.Q., $F(2, 6) = 2.40$, or reading level, $F(2, 6) = 0.75$, all $ps < .05$. The means and standard deviations of criterion measures for all three groups are presented in Table 1. The results of a multivariate one-way analysis of variance (MANOVA) on pretreatment scores also indicated no significant differences between groups on any dependent measures, except for the referential communication speaker task, $F(2, 7) = 7.01$ $p > .05$ (see Tables 2 and 3). Overall, these findings indicate that groups did not differ significantly on either criterion or dependent measures prior to treatment, except for the referential communication speaker task.

Table 1

Means and standard deviations of criterion measures at pretreatment for all groups

	Group		
Measure	Ref. Com	IPPS	Control
Age			
M	10.00	9.00	10.25
SD	1.73	0.00	0.50
SES			
M	46.90	60.85	56.06
SD	21.20	11.89	21.23
Teacher Rating			
M	65.67	76.00	62.00
SD	8.62	7.07	4.32
I.Q. Scores			
M	96.67	92.50	104.50
SD	5.77	10.60	5.69
Reading Level			
M	12.67	14.50	17.75
SD	1.15	3.54	7.50

Table 2

Summary of MANOVAs on pretreatment scores for primary dependent measures

SOURCE	SS	df	MS	F
MEPS				
Group	2.67	2	1.33	0.28
Error	42.25	9	4.69	
M-CON				
Group	2.17	2	1.08	0.30
Error	32.50	9	3.61	
SPEAKER				
Group	7566.00	2	3783.00	7.02*
Error	4852.25	9	539.14	
LISTENER				
Group	1.17	2	0.58	0.09
Error	61.75	9	6.86	

*$p < .05$

Table 3

Summary of MANOVAs on pretreatment scores for secondary dependent measures

SOURCE	SS	df	MS	F
HARTER				
Group	154.17	2	77.08	3.71
Error	186.75	9	20.75	
POS. PEER NOM.				
Group	0.04	2	0.02	0.11
Error	1.78	9	0.20	
NEG. PEER NOM.				
Group	0.35	2	0.18	2.98
Error	0.54	9	0.06	
ROSTER				
Group	1.24	2	0.62	1.81
Error	3.09	9	0.34	

Analyses Of Variance And Covariance For Repeated Measures

For all measures showing nonsignificant group differences at pretreatment, univariate 3(group) X 3(time) ANOVAs for repeated measures were performed. Since the analysis of pretreatment scores on the speaker task indicated differences between groups at that time, an analysis of covariance (ANCOVA) was conducted on these scores, with pretreatment scores serving as the covariate. Post hoc Scheffé tests were then performed on mean scores to further examine the significant effects obtained. See Appendix L for the means and standard deviations on all measures for all groups at each testing period.

Primary Measures

Analyses of the primary dependent measures indicated a significant main effect of time for the referential communication listener task, $\underline{F}(2, 18) = 14.89$, $\underline{p}<.0001$, where mean scores at follow-up ($\underline{M} = 7.42$) and post-treatment ($\underline{M} = 7.50$) were found to differ significantly from the mean pretreatment scores ($\underline{M} = 3.92$) but not from each other. Figure 1 depicts a steady increase in performance by all groups from pretreatment to post-treatment which was maintained at follow-up.

The results of the ANCOVA indicated a significant main effect of time on the referential communication speaker task, $\underline{F}(1, 9) = 5.70$, $\underline{p}<.05$. A post hoc Scheffé test showed that the performance of all groups increased significantly from pretreatment to follow-up. However, no significant differences were found between mean scores at pretreatment ($\underline{M} = 76.25$) and post-treatment ($\underline{M} = 96.17$) only, or between post-treatment and follow-up ($\underline{M} = 114.25$) only. Figure 2 illustrates the mean scores for all groups over time for the speaker task. Table 4

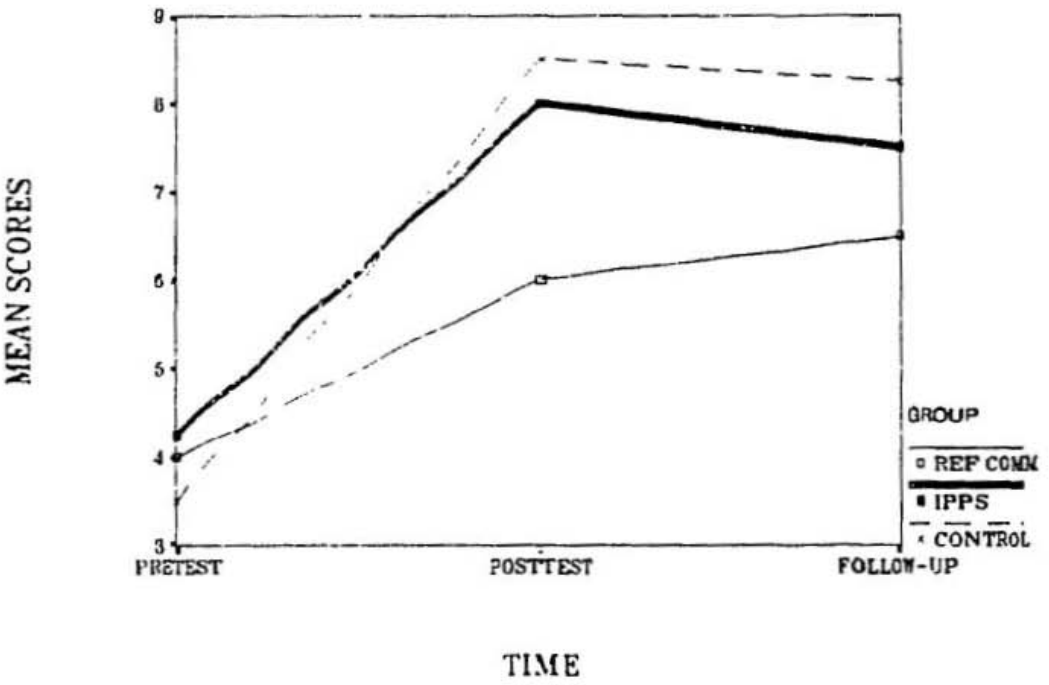

Figure 1. Mean scores for the referential communication listener task over time for each of three groups

contains summaries of the ANOVA and ANCOVA for both referential communication measures. No significant differences were found for either of the two interpersonal problem-solving measures. For a summary of the analyses of variance on the interpersonal problem-solving measures consult Table 5.

Secondary Measures

Analyses of variance were also performed on the secondary dependent measures. The results showed a significant main effect of time for the roster ratings, $F(2, 18) = 4.20$, $p<.05$ (consult Table 6). However, a post hoc Scheffé test showed no significant differences between any two testing times. In contrast, there were no main effects for the positive and negative peer nomination measures (see Table 7).

The social subscale of the self-concept measure showed a significant main effect of group, $F(1, 9) = 5.38$, $p<.05$. (Table 8), with post hoc Scheffé tests indicating that the means for the referential communication ($M = 16.75$), interpersonal problem-solving ($M = 21.75$), and the attention control ($M = 19.00$) groups all differed significantly from each other. Figure 3 depicts the plotted group means for this measure. It can be seen that all groups improved over time on the roster ratings, with the interpersonal problem-solving group showing the highest scores on the self-concept measure at all testing times.

Analysis Of Variance Using Difference Scores

The previous results provide limited information with respect to the first hypothesis concerning changes in performance over time in each group relative to the others. Comparisons across groups in terms of their effectiveness in improving performance on the respective tasks (i.e., those for which the group was trained)

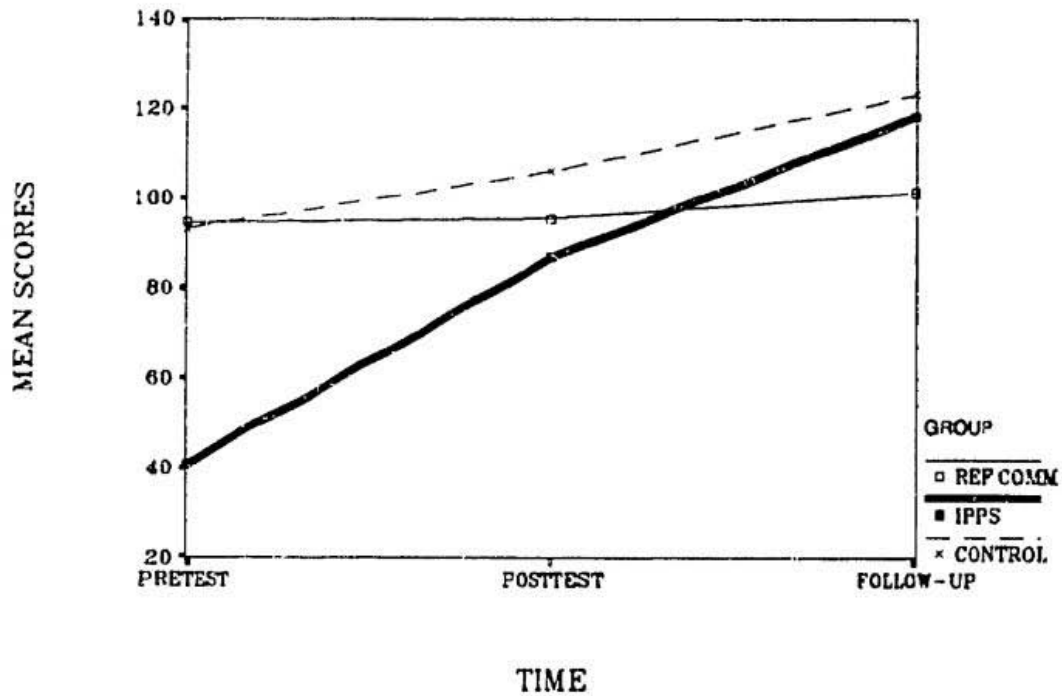

Figure 2. Mean scores for the referential communication speaker task over time for each of three groups

Table 4

Summary of ANOVA and ANCOVA for referential communication measures

SOURCE	SS	df	MS	F
LISTENER[a]				
Between				
Group(G)	11.06	2	5.53	0.55
Error	90.83	9	10.09	
Within				
Time(T)	100.39	2	50.19	14.89**
G X T	10.28	4	2.57	0.76
Error	60.67	18	3.37	
SPEAKER[b]				
Between				
Group(G)	1524.32	2	762.16	1.94
Error	3138.89	8	392.36	
Within				
Time(T)	1962.04	1	1962.04	5.70*
G X T	652.33	2	336.17	0.95
Error	3097.13	9	344.13	

*$p < .05$
**$p < .001$

[a]ANOVA
[b]ANCOVA

Table 5

Summary of ANOVAs for interpersonal problem-solving measures

SOURCE	SS	df	MS	F
MEPS				
Between				
Group(G)	7.17	2	3.58	0.67
Error	48.25	9	5.36	
Within				
Time(T)	0.67	2	0.33	0.09
G X T	13.67	4	3.42	0.92
Error	67.00	18	3.72	
M-CON				
Between				
Group(G)	6.89	2	3.44	0.71
Error	43.67	9	4.85	
Within				
Time(T)	10.89	2	5.44	1.23
G X T	10.61	4	2.65	0.60
Error	79.83	18	4.44	

Table 6

Summary of ANOVAs for roster rating measure

SOURCE	SS	df	MS	F
ROSTER				
Between				
Group(G)	0.83	2	0.41	0.05
Error	7.48	9	0.83	
Within				
Time(T)	0.61	2	0.30	4.29*
G X T	0.70	4	0.18	2.49
Error	1.27	18	0.07	

*$p < .05$

Table 7

Summary of ANOVAs for positive and negative peer nomination measures

SOURCE	SS	df	MS	F
POS. PEER NOM.				
Between				
Group(G)	0.18	2	0.09	0.27
Error	2.99	9	0.33	
Within				
Time(T)	0.09	2	0.04	1.11
G X T	0.07	4	0.02	0.42
Error	0.70	18	0.04	
NEG. PEER NOM.				
Between				
Group(G)	0.34	2	0.17	1.79
Error	0.86	9	0.10	
Within				
Time(T)	0.07	2	0.04	1.60
G X T	0.21	4	0.05	2.44
Error	0.40	18	0.02	

Table 8

Summary of ANOVAs for the social self-concept measure

SOURCE	SS	df	MS	F
HARTER				
Between				
Group(G)	400.67	2	200.33	5.38*
Error	335.42	9	37.27	
Within				
Time(T)	20.17	2	14.58	1.38
G X T	35.17	4	8.79	0.83
Error	190.33	18	10.57	

*$p < .05$

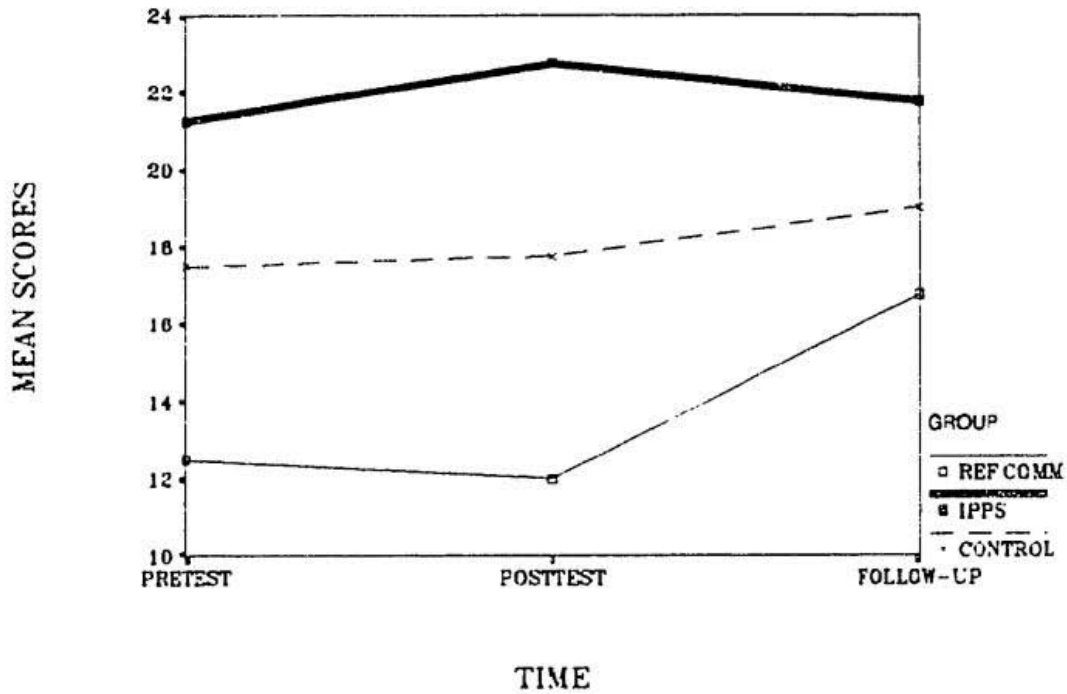

Figure 3. Mean scores for the self-concept measure over time for each of three groups

were made by collapsing scores on the primary dependent measures across time. A series of ANOVAs were performed using the difference scores between pretreatment and post-treatment and pretreatment and follow-up. These resulted in a main effect of group on the speaker task with significant differences in change scores from pretreatment to post-treatment (Table 9), and pretreatment to follow-up (Table 10). A post hoc Scheffé test using difference scores indicated a significant difference in change scores from pretreatment to follow-up between the referential communication ($\underline{M}$ = 6.50) and the interpersonal problem-solving ($\underline{M}$ = 77.50) groups, with neither of these groups differing from the attention control group ($\underline{M}$ = 30.00). A post hoc Scheffé test performed on change scores between pretreatment and post-treatment, however, indicated no significant differences between the referential communication ($\underline{M}$ = 0.75), the interpersonal problem-solving ($\underline{M}$ = 46.25) or the attention control ($\underline{M}$ = 12.75) groups. Significant differences in change scores were not found on the listener task or the two interpersonal problem-solving tasks.

Chi Square Analysis

In order to determine the group membership of those subjects who did show improvement on the primary dependent measures, difference scores between pretreatment and post-treatment, and pretreatment and follow-up testing times were analyzed using chi square analyses. Median difference scores of the entire sample on each measure were used as cut-off criteria. Chi square analyses were then performed, contrasting the observed number of children above the median with those expected by chance.

The results indicated a significant improvement related to group membership

Table 9

Summary of ANOVAs using difference scores between pretreatment and post-treatment for primary dependent measures

SOURCE	SS	df	MS	F
MEPS				
Group	22.17	2	11.08	1.32
Error	75.50	9	8.39	
M-CON				
Group	4.50	2	2.25	0.31
Error	65.50	9	7.28	
SPEAKER				
Group	4448.67	2	2224.33	4.28*
Error	4680.25	9	520.03	
LISTENER				
Group	18.17	2	9.08	0.96
Error	84.75	9	9.42	

*$p < .05$

Table 10

Summary of ANOVAs using difference scores between pretreatment and follow-up for primary dependent measures

SOURCE	SS	df	MS	F
MEPS				
Group	8.67	2	4.33	1.08
Error	36.00	9	4.00	
M-CON				
Group	21.17	2	10.58	0.78
Error	122.50	9	13.61	
SPEAKER				
Group	10466.00	2	5233.00	8.21*
Error	5738.00	9	637.56	
LISTENER				
Group	10.50	2	5.25	0.65
Error	72.50	9	8.06	

*$p < .05$

for the speaker task, $\chi^2(8, \underline{N} = 12) = 8.91$, $\underline{p}<.05$, between pretreatment and follow-up but not between pretreatment and post-treatment. Further examination of the distribution of scores showed that, in contrast to none of the children in the referential communication skills training group, all four children in the interpersonal problem-solving skills training group and two of the four attention control children yielded change scores above the median.

A significant improvement related to group membership was also found for the MEPS measure, $\chi^2(6, \underline{N} = 12) = 6.00$, $\underline{p}<.05$, between pretreatment and post-treatment testing periods but not between pretreatment and follow-up. Again, the chi square analysis indicated that three of the four children in the interpersonal problem-solving skills training group and three of the four children in the attention control group showed improvement above the median. Table 11 contains the frequency distribution of difference scores above the median for each group. These findings suggest that on measures found to be significant by chi square analysis, those children who showed the most improvement over time were primarily those who received either interpersonal problem-solving skills training or no formal training at all.

Pearson Product Moment Correlations

In order to test the second hypothesis regarding the extent to which improvement on measures for which training was provided was in turn related to improvement in self-concept and/or social status, PPMCs were conducted using difference scores between pretreatment and follow-up. Change scores between pretreatment and follow-up were used rather than between pretreatment and post-treatment since performance on secondary measures was expected to result

Table 11

Frequency of difference scores falling above the median for each group on all primary dependent measures for pretreatment/post-treatment and pretreatment/follow-up assessment periods

	Group		
Measure	Ref. Com	IPPS	Control
Pretreatment/Post-treatment			
MEPS	0	3	3
M-CON	2	3	1
SPEAKER	1	4	2
LISTENER	1	2	3
Pretreatment/Follow-up			
MEPS	3	3	2
M-CON	2	3	1
SPEAKER	0	1	2
LISTENER	1	2	3

from improvement on the primary measures and, therefore, some delay in their change was expected.

The results of this analysis indicated a low but significant positive correlation, $r(12) = .51$, $p<.05$, between improvement on the listener task and negative peer nominations. Significant negative correlations were found between the listener task and the roster ratings, $r(12) = -.57$, $p<.05$, and the listener task and positive peer nominations, $r(12) = -.75$, $p<.05$. A significant negative correlation was also found between improvement on the speaker task and the roster ratings measure, $r(12) = -.58$, $p<.05$. Given the previously reported findings of improvements on both referential communication tasks and the roster ratings by all groups over time, these correlations are most likely statistical artifacts.

Correlations of difference scores from pretreatment to follow-up on the three social status measures was also conducted. The results of this analysis indicated a highly significant positive correlation, $r(12) = .71$, $p<.05$, between positive peer nominations and roster ratings, and a moderately significant negative correlation, $r(12) = -.58$, $p<.05$, between negative peer nominations and roster ratings. A trend towards a significant negative correlation, $r(12) = -.48$, $p<.10$, between positive and negative peer nominations was also found.

Clinical Analysis

The sociometric ratings were further examined for changes over time which might be clinically meaningful but not necessarily statistically significant. This was done by categorizing children into the various social status groups at each assessment time using the combined information of the positive and negative peer nomination ratings first and then the roster ratings. Table 12 illustrates the

criterion used to categorize children into social status groups using the positive and negative peer nominations ratings.

Using this criterion then, children were categorized at all three assessment periods and comparisons were made across groups. Table 13 provides the categories given to each child over time. Based on this categorization, only three children, one in the referential communication and two in the attention control group, were actually found to be rejected by their peers at any given assessment period. As well, there did not appear to be any particular pattern of change across time or group. Of the four children who showed changes in status over time on this measure, they appeared equally as likely to change from a positive status to a negative one as the reverse.

Scores on the roster rating measure were also used to examine changes over time with respect to unpopular, average, and popular statuses. Since children were rated on a 3-point scale, those with ratings between 0 and .99 were categorized as unpopular, between 1 and 1.99 were average, and between 2 and 3 were popular. Table 14 contains the results of the categorization of each child over time. The results indicated more variability in categories across time than that indicated by the peer nominations. As well, very little of the change in status was extreme. In fact, only one child went from a rating of unpopular to popular.

A comparison of the scores on the peer nominations and roster ratings indicated that those children who showed change in social status based on the peer nomination ratings did not necessarily show change on the roster ratings and vice versa. In fact, only two children showed changes on both measures, and very few children showed contradictory ratings between measures.

Table 12

Categorization table for positive and negative peer nomination measures

		Positive Ratings	
		≥ +0.50	≤ -0.50
Negative Ratings	≥ +0.50	CONTROVERSIAL	REJECTED
	≤ -0.50	POPULAR	NEGLECTED

Table 13

Social status ratings based on positive and negative nomination measures for all subjects at all assessment periods

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	popular	neglected	popular
2	rejected	popular	popular
3	popular	popular	popular
4	neglected	neglected	neglected
IPPS			
5	neglected	neglected	neglected
6	popular	popular	popular
7	popular	popular	popular
8	popular	popular	popular
Control			
9	popular	popular	popular
10	popular	popular	popular
11	rejected	neglected	rejected
12	neglected	rejected	neglected

Table 14

Social status ratings based on the roster rating measure for all subjects at all assessment periods

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	average	average	average
2	unpopular	average	average
3	average	popular	average
4	average	popular	popular
IPPS			
5	average	average	average
6	popular	average	popular
7	popular	popular	popular
8	average	average	popular
Control			
9	popular	popular	popular
10	average	popular	popular
11	unpopular	unpopular	popular
12	average	average	average

Discussion

The data suggest that training learning disabled elementary school children in referential communication or interpersonal problem-solving is no more effective for improving skills in these areas than an attention control group, involving no formal skills training. It was predicted that one or both treatment programmes would result in improvement on their respective measures, in contrast to the attention control group which was not expected to show improvement on any of the measures. Thus the data provide no support for this first hypothesis. With respect to the second hypothesis, the referential communication and interpersonal problem-solving skills training programmes were found to be equally as effective as the attention control group for improving scores on positive and negative peer nominations and roster ratings. In contrast, some support is available for differential improvement by group on the self-concept measure.

Referential Communication Skills

Significant improvement over time by all three groups with regard to the referential communication measures, both speaker and listener tasks, may well be evidence of practice effects due to repeated testing sessions. Although this appears to be a highly probable explanation since the results show a progressive, or at least constant, improvement for all three groups over time, such precautions as the use of different designs and referents at each testing period were specifically taken to guard against this.

Alternatively, these findings may be evidence that exposure to a social situation on a regular basis provides children with the opportunity to practice referential communication skills which they may already possess. This hypothesis has also been noted by White and Blackham (1985), who have suggested that formal skills training is unnecessary because neglected and rejected children may already have the requisite skills in their repertoire but do not receive sufficient reinforcement to exhibit them. They, therefore, speculated that a different approach which emphasizes the expression and maintenance of these skills may be more in keeping with the needs of LD children. Closer examination of the content and structure of the attention control group shows that the majority of the sessions involved games which require both the cooperation of others and good communication skills. Perhaps this alone is enough to encourage the development of referential communication skills in LD children of this particular age group. Unfortunately, without the information which could be provided by a no treatment waiting list control group, it is impossible to differentiate between improvement which resulted from exposure and that which occurred as a result of practice effects.

The significant group differences on the referential communication speaker task suggested by the ANOVA using difference scores between pretreatment and follow-up should not be viewed as a real change since a significant difference between the interpersonal problem-solving group and the referential communication and attention control groups was evident at pretreatment testing. Three of the lowest scores on this measure for the entire sample were found in the interpersonal problem-solving group, a problem which could not be prevented

since groups were not equated according to pretreatment scores for this measure. The finding that this group, at follow-up, had scores equivalent to the other two groups, despite no training in referential communication skills, suggests the possibility of an overlap of skills between the two programmes. A relationship between interpersonal problem-solving and referential communication skills is also suggested by the results of the chi square analysis, where all four of the children in the interpersonal problem-solving group showed post-treatment scores above the median of the group for the referential communication task. It has previously been suggested by Flavell (1977) that interpersonal problem-solving and referential communication are both complex skills which involve some similar, if not identical, subskills. For example, the ability to take another person's perspective has been identified as an important skill in both interpersonal problem-solving (Urbain & Kendall, 1980) and referential communication (Shantz, 1981). Although both interventions could have been training similar type subskills, the interpersonal problem-solving programme appears to have provided a more salient context for learning, resulting in the increase in those children's performance on the referential communication task, in contrast to the limited impact of the referential communication training on performance on the interpersonal problem-solving measures.

Interpersonal Problem-Solving Skills

The overall lack of significant improvement on the interpersonal problem-solving measures by the interpersonal problem-solving group contradicts a number of the findings of previous research in the area (Elardo & Caldwell, 1979; Weissberg et al., 1981; Nelson & Carson, 1988; Stiefvater et al., 1986). However,

the present study differs from previous research in a number of respects. First, the majority of the previous research involved long-term intervention (i.e. length of the school year) in contrast to the 6-week intervention of the present study. However, the success found by Stiefvater et al. (1983), with their 5-week intervention programme, suggests that the limited time period of the present intervention programme does not completely explain its ineffectiveness. Second, all the preceeding programmes were implemented within the classroom on a daily basis. In contrast, the present study involved after-school sessions once a week, where children did not know one another or interact with each other outside of these sessions. Perhaps when children are taught in the classroom setting, all learning the same "rules" of problem-solving, there is a greater probability of peer modelling or cooperation by others when a child attempts to solve a problem by the methods they, as a group, were taught. In other words, the commonality of the "rules" may increase the likelihood of others being responsive to them. In contrast, children taught outside of the classroom setting may have to at least explain and possibly convince their classmates of the rules while attempting to resolve a problem, a situation especially difficult if they are also rejected by their peers. Thus, there appears to be a greater possibility of skills being practiced, encouraged, and in turn learned, when one's peers are also being taught the same skills. This explanation is supported by Hazel et al. (1982), whose training programme did not take place within the classroom setting and who also reported no significant improvement in interpersonal problem-soiving skills.

Self-Concept

The significant difference reported across groups on the self-concept measure indicates that the group trained in referential communication skills was primarily responsible for the significant improvement occurring at follow-up. An examination of the means for each group shows that scores at pretreatment, post-treatment, and follow-up for the referential communication group were relatively low, suggesting that this group was the most appropriate target for change. In other words, the low score found at initial testing may reflect that there was more room for improvement in this particular group than in the others.

Social Status

The findings from the social status measures indicate significant correlations between positive peer nominations and roster ratings in the expected direction, and between negative peer nominations and both positive nominations and roster ratings in a negative direction. These findings are in keeping with previous research by Hymel and Asher (1977; cited in Asher & Hymel, 1981) who reported a positive correlation of .63 between positive peer nominations and roster ratings. The trend towards a significant negative correlation between positive and negative peer nominations is also supported by similar findings in the literature, where correlations ranged from -.21 (Coie & Dodge, 1983) to -.62 (Taylor & Connolly, 1987).

Improvement by all three groups over time on the roster ratings suggests that perhaps exposure to other children on a weekly basis provided children with the opportunity to practice their skills and become more socially competent. Again, the nature of all three of the groups was such that social interaction and the

cooperation of others was necessary.

The significant improvement by the three treatment groups on the roster ratings but not the peer nomination ratings suggests that all children were perceived as more likable by the unfamiliar peers following treatment, but not necessarily to the extent of being chosen as a playmate. It is noteworthy that the target children did not show similar improvement on the peer nomination ratings, particularly since these measures have been suggested to be more sensitive to change than the roster ratings (Asher & Hymel, 1981). One possible explanation for this lack of change is that the peer nominations reflect ratings of children at either end of the social status continuum whereas the roster ratings provide information about children who fell both at the extreme ends as well as those in the middle. Thus, change which occurred may have been in the middle of the continuum which would be reflected in the roster ratings but not necessarily in the peer nomination ratings. This is not surprising given the limited number of children whose scores actually fall in the extreme areas.

Given that only 25% of the sample were actually found to be rejected by their peers, based on peer nominations, it is virtually impossible to make any judgements concerning what effect each programme may specifically have had on rejected children. The fact that the majority of the children were not found to be less popular or more rejected by peers to begin with may be a contributing factor to the null effects of the present study. The teacher rating forms, given out at post-treatment and follow-up, did not yield a very high return rate, making them impossible to analyze statistically. This is unfortunate as it would have been interesting to examine whether the improvements in social status, evidenced by

the roster ratings, also generalized to children's social status in the classroom.

The use of the social status categories shows that although children may have increased their social status scores, there may not have been enough change to produce a change of category. The results suggest that ratings were consistent across peer nomination and roster rating measures, as expected by the significant correlations found between these measures. Since the literature differentiates children with respect to risk for later adjustment on the basis of categories, it is important to consider how the children of the present study fair in this light. For the most part, children's category membership remained consistent across time and situation (i.e., different playgroups), a finding in keeping with the literature on social status (Coie & Dodge, 1983). With regard to later adjustment difficulties related to poor social status, this sample of children did not appear to be at increased risk. However, a larger sample of ratings from unfamiliar peers should certainly be considered before drawing any firm conclusions.

The second hypothesis, which predicted that improvement on trained skills would generalize to improvements in self-concept and social status was also not supported by the data. All significant correlations reported indicate that the relationships between the two referential communication tasks, the self-concept measure, and the three peer ratings were opposite to the direction expected. In other words, these correlations suggest that, overall, an increase in performance on the referential communication tasks is related to a decrease in social status. As well, correlations between the interpersonal problem-solving measures and the secondary dependent measures showed a nonsignificant relationship. This is

rather unexpected given the findings of studies indicating a relationship between social status and both referential communication (Galutira, 1985; Gottman et al., 1975; Putallaz & Gottman, 1981; Rubin, 1972) and interpersonal problem-solving (Silver & Young, 1985; Stiefvater et al., 1986). In particular, these findings differ from those previously reported by Galutira (1985) and Stiefvater et al. (1986) whose treatment programmes specifically resulted in improvements on the trained task and, in turn, increased social status. However, both these studies employed subject populations other than LD children.

The most likely explanation for this unexpected finding is that the significant main effect of time on the roster ratings produced differences in the rank order of children's improvement scores on the referential communication measures relative to the social status measures. In other words, the negative correlation does not necessarily mean that subjects got worse, but rather that the findings of change for each measure were not parallel. This would then result in negative correlations despite groups improving significantly on both measures. Another less likely explanation would be that some other factor was contributing to the change in social status other than referential communication.

Problems of the Research

A number of methodological problems may explain why the two treatment groups proved to be no more effective than the attention control group. The small group size is the most obvious one. In order to overcome some of the methodological problems of previous research, strict criteria were established for subject selection. As a result, the number of children who met these criteria were reduced. Therefore, the effects of the treatment programmes on four children per

group needed to be strong in order to obtain statistically significant results with so few children.

Difficulties encountered in conducting the treatment programmes is another problem. Despite the utmost persistence in maintaining control, it was sometimes difficult to provide structured material to children as required in both the referential communication and interpersonal problem-solving groups, due to acting out behaviours by some of the children. This problem occurred with the two treatment groups but not with the attention control group. Speculation as to why these difficulties occurred is related to the programme's design. The training in the referential communication and interpersonal problem-solving groups was very structured in comparison to the control group. The lack of any difficulties in carrying out the control group may have in itself, been more conducive to the learning of more appropriate social interactions and the development of peer relations within the group. A better understanding of the effects of the control group could be gained through comparison with a waiting list control. Future research with LD children should thus take into consideration the amount of structure imposed on such children by the training.

Another problem involves the assumption of the independence of subjects. Nelson and Carson (1988) noted in their study on interpersonal problem-solving skills training that although their programme was effective in improving the skills of most of the classes examined, one class in particular showed no improvement, which they attributed to problems with a difficult class. This finding shows the importance of the classroom context in determining the effectiveness of the intervention. As well, it sheds some light on findings of the present study. In

actuality, each of the three treatment groups constitutes a sample size of one rather than three, since group interactions ensure that each child is not independent of the others in their group. For example, if there is a disruptive child in one of the groups, he/she will likely influence the ability of the other children in the group to learn the material. This may result in falsely concluding that the intervention given to a particular group was ineffective when in fact it was due to an inability in properly conducting the programme. This is of particular importance to the present study where children were chosen as a result of their unpopularity, a status associated with acting out behaviours (Hartup, 1983). Given this methodological problem, it is difficult to attribute a lack of improvement by a given group solely to the ineffectiveness of the training programme. Ideally then, a number of groups should be used to test the effectiveness of each intervention, a methodological consideration very few of the previous studies have taken into account.

A final difficulty with the study is related to an inconsistency seen between the findings of the sociometric measures and the unpopular subscale of the Achenbach teacher rating form for identifying socially rejected children. It would have perhaps been more beneficial if this subscale was used in conjunction with the social withdrawal subscale on this measure. A high score on the unpopular subscale and a low score on the social withdrawal subscale would have identified children who were rejected only, as opposed to both neglected and rejected children. As well, a more strict criteria for use with these subscales would decrease the probability of falsely identifying popular children as rejected or neglected, as occurred in the present study. In order to have such criteria, a larger pool of

potential subjects would certainly need to be available. A comparison of the teacher and the peer ratings suggests that these are not very highly correlated. Thus, future research should perhaps consider the use of both peer sociometric and teacher ratings as criteria, providing time permits.

Conclusion

Unfortunately, given the time restraints imposed on the treatment groups by the study, neither referential communication nor interpersonal problem-solving skills training were found to be more effective approaches, in comparison to an attention control, for improving referential communication, interpersonal problem-solving, or in turn, self-concept and/or social status in 8- to 12- year old learning disabled children. Given some success of previous research with other populations, the results of the present study suggest that these types of interventions are perhaps not suitable for a learning disabled population. However, before rejecting the effectiveness of these programmes altogether, replication of these findings is certainly necessary. It is hoped that future research in the area, making use of a waiting list control group, more extensive treatment programmes, and a larger subject population, will have more success with regard to helping learning disabled children improve their social status.

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APPENDIX A

Block Designs And Instructions For The Referential Communication Speaker Task

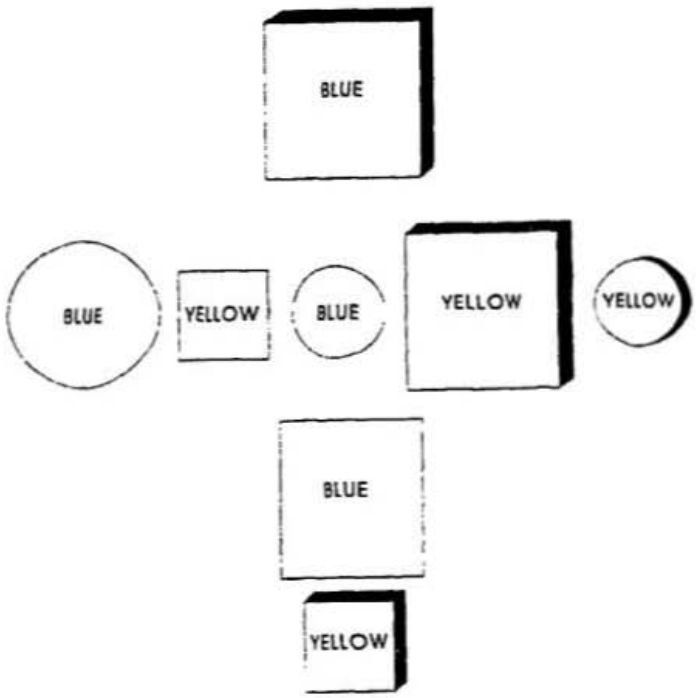
The blocks were shown and described to the child in the following way: "See these shapes - they are all different from each other in some way. They are either squares or circles, yellow or blue, small or big, and thin or thick". The child was then asked a series of questions such as, "What shape is this?; Can you find me a thick one?", to ensure that he/she was able to distinguish between them. Following this, the child was shown an example of a design using eight of the shapes presented on a blank sheet of 8 1/2" by 11" paper, which the experimenter described to the child as follows:

> Now I'm going to describe a design to you that I have made using some of the shapes. When I am finished I'm going to make some more designs and I want you to tell or describe them to me. Okay? Do you understand?

After the example, the child was shown three more designs, one at a time, and asked to describe them.

Block Designs

Design 1:



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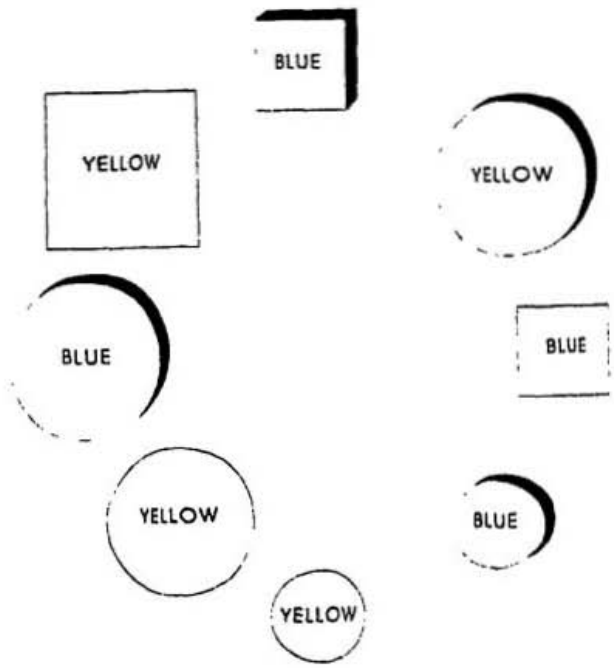
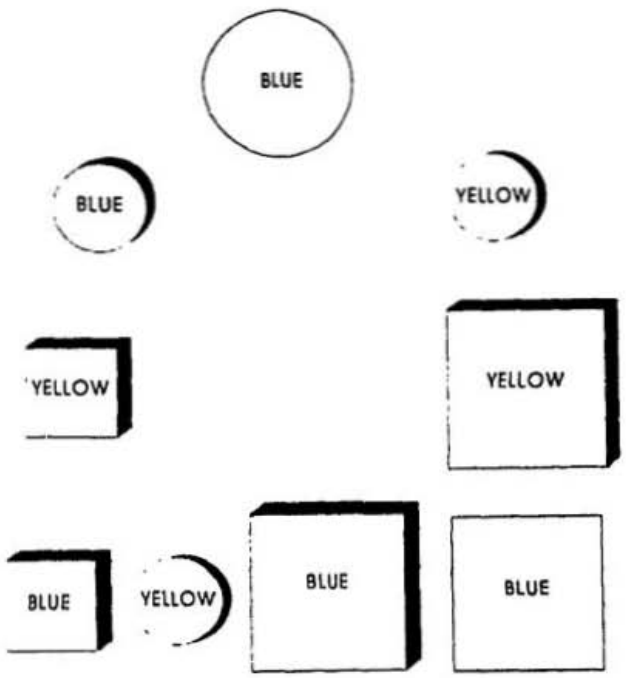


Design 3:



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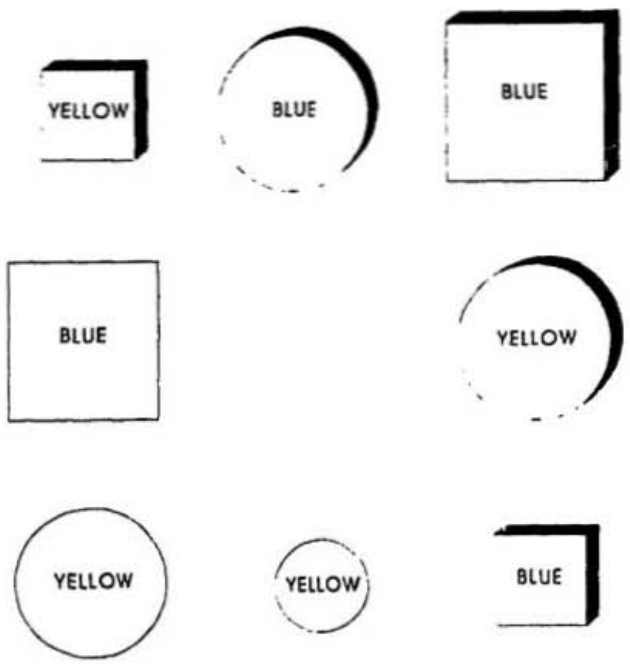
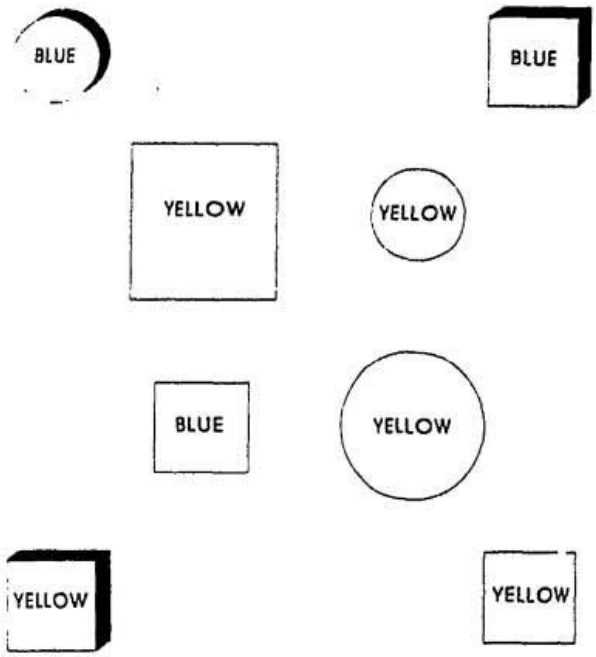


Design 5:



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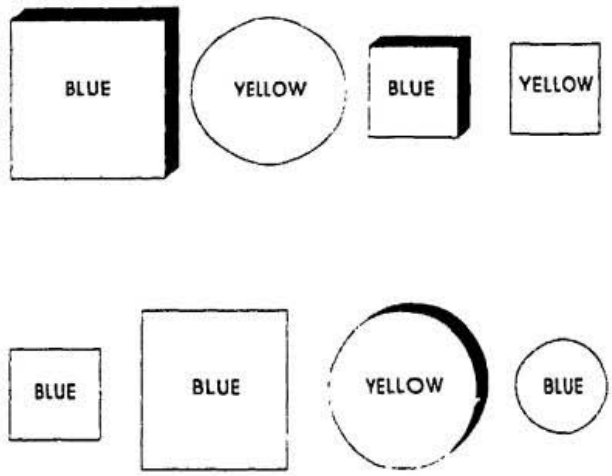
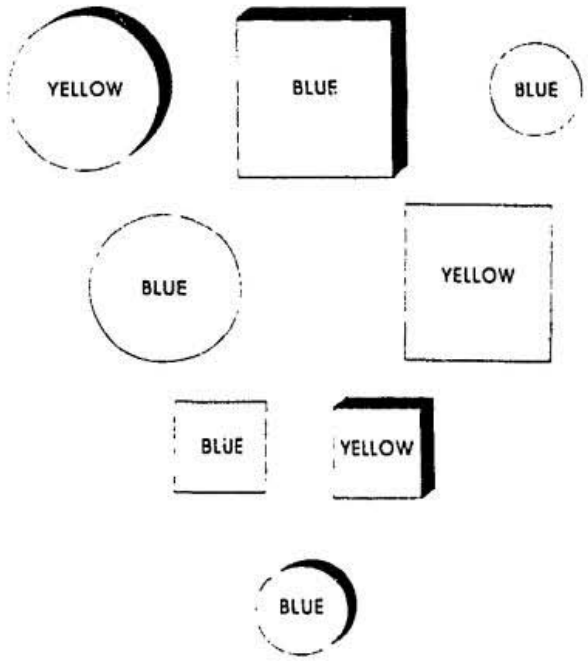


Design 7:



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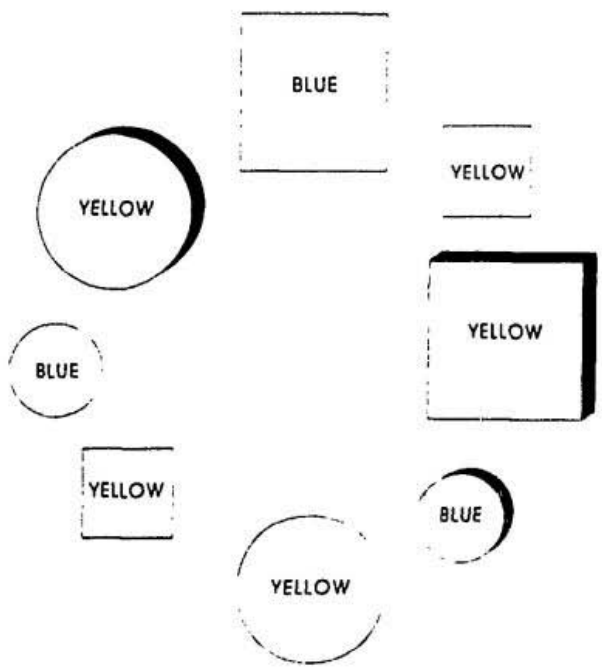
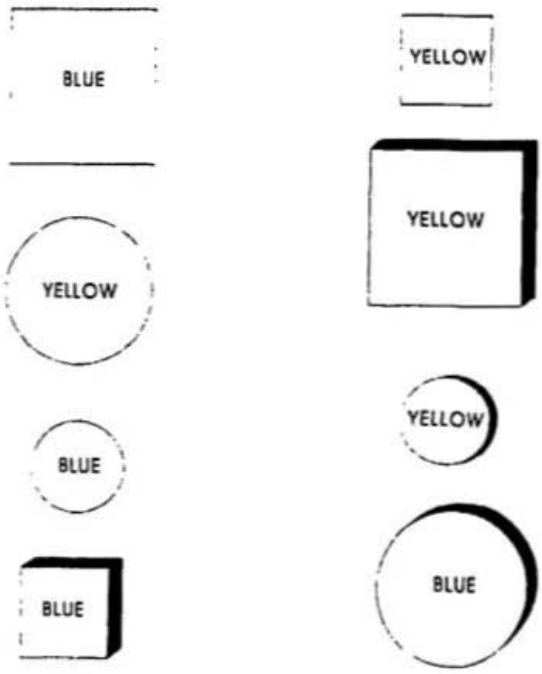


Design 0:



APPENDIX B

Scoring Procedures For The Referential Communication Speaker Task (Spekman, 1978)

1-Attributes:

0-4 pts. given for the number of attributes of the selected block which are identical to the standard to a total of 32 pts. maximum per design.

e.g.,

Standard	Response	Score
thin large blue circle	thin large blue circle	4
	thin small blue circle	3
	thin small yellow circle	2
	thin small yellow square	1

2-Spatial:

0-4 pts. given for noting spatial relations among objects for a total of 32 pts. maximum per design.

a) left-right relationship:

0-1 pt. given for appropriate information concerning left and right relations.

e.g.,	The yellow one is next to the blue square	0 pt.
	The yellow one is on the right of the circle	1 pt.

b) spacing:

0-1 pt. given for specific information estimating distances to a nonspecific statement that the blocks do not touch each other or the edge of the paper.

e.g.,	About two inches down from that...	1 pt.
	A little below that...	1 pt.
	Next to that put a...	0 pt.
	Across from that there's a...	0 pt.

c) location:

0-2 pts. given for information on location with respect to another block or location on the page.

2 pts. if information is clearly given and correct

e.g., Down diagonally from there... 2 pts.
On the top right hand corner... 2 pts.

1 pt. if information is only partially given (i.e., says to place the block diagonally, but doesn't say up or down) or information is generally present, but is stated in such a way that easily causes confusion or speaker relies on gestures.

e.g.,

At the top of the page... 1 pt.
In the corner... 1 pt.
The line goes this way... 1 pt.
On the other side... 0 pt.

0 pts. if information is inaccurate or no information is given regarding location

3-**Gestalt**:

2 pts. given for a description of the overall design for a total of 8 pts. maximum.

e.g., It's in the shape of a triangle... 2 pts.

Design	Responses
4	square, box
3,9	triangle
2,7	circle, diamond, kite, oval
6,8	rectangle
5	multiplication sign, times, "X"
1	plus sign, cross

APPENDIX C

Instructions For The Referential Communication Listener Task

Children were shown the same blocks as in the speaker task but in a random fashion. They were then given the following instructions adapted from Courage (1989):

> We are going to play a game. I'm going to tell you about one of these shapes which I will call the 'special one'. Your job is to find the special one that I'm talking about and put it on the blank sheet of paper. Sometimes I won't tell you enough information about the special one and you won't know which one I mean. When that happens and you don't know which one I'm talking about, you can ask me questions to help you find the 'special' one. Do you understand?

The child was then presented with a series of 10 messages by the experimenter. The messages were either totally informative - all four attributes were given (e.g., "It's a small, thin, yellow circle"), partially informative - three attributes were given (e.g., "It's a large, blue square"), partially uninformative - only two attributes were given (e.g., "It's a thick circle"), and totally uninformative - only one attribute was given (e.g., "It's a square"). These were presented in a predetermined random order to each child. The children had to ask enough questions to narrow the shape down to one possibility in order for their response to be scored as correct. For example, if they were presented with "It's a large circle" two questions were needed - one concerning colour and the other concerning width.

APPENDIX D

Scenarios For The Interpersonal Problem-Solving Task Means-End Thinking[1]

Each child was given the following instructions prior to the three stories:

> What we are going to do is not a test. There are no right or wrong answers, okay? What you are going to do is make up some stories and I'm going to help you. I will tell you the beginning and the end of the story and you make up the middle part. In other words you make up what happens in between the beginning and the end of the story I will give you. Do you have any questions before we begin? (Spivack, Shure, & Platt, 1985, p.25)

The beginning and the end of each story was then read prior to the child responding.

Story 1:

One day George (Amy) was standing around with some other kids, when one of the kids said something really nasty to George (Amy). George (Amy) got very mad. He (she) got so mad he (she) decided to get even with the other boy (girl).

The story ends with George (Amy) happy because he (she) got even. Why is he (she) happy? Make up a real good story and remember that the story begins with George (Amy) getting mad and deciding to get even. Now what happens?

---

[1] Note. From "Manual for means-end problem-solving" by G. Spivack, M. Shure, and J. Platt, 1985, Philadelphia, PA.: Hahnemann University. Copyright 1985 by Spivack, Shure, and Platt. Reprinted by permission.

Story 2:

Al (Joyce) had just moved into the neighbourhood. He (she) didn't know anyone and felt very lonely. He (she) wanted to have friends.

The story ends with Al (Joyce) having many good friends and feeling at home in the neighbourhood. How does the story end? Make up a real good story and remember that the story begins with Al (Joyce) in a new neighbourhood wanting to make new friends. Now what happens?

Story 3:

This year the school decided that every class was going to choose a class leader. Jim (Jane) wanted the class to choose him (her).

The story ends with Jim (Jane) being chosen class leader by the kids in his (her) class. The story ends with the kids choosing who? Make up a real good story and remember that the story begins with the Jim (Jane) wanting the class to choose him (her) as class leader. What happens now?

In instances where a child began by listing discrete alternative solutions, the experimenter redirected them by emphasizing that they tell a story from the beginning to the end, as though they were watching a movie.

APPENDIX E

Scenarios For The Interpersonal Problem-Solving Task Consequential Thinking[2]

Each child was given the following instructions prior to the story roots:

> I'm going to tell you about a boy(girl) who has a problem and the way that they solve that problem. What I want you to do is make a list of as many different things that *might* happen next, after they solve the problem. This is not like making a story, we just want to make a list of many different things that *could* happen.

Story Root 1:

James (Judy) was very mad at his (her) friend Karl (Karen) and James (Judy) decided to really tell Karl (Karen) off and he (she) did. What might happen next?

Story Root 2:

David (Donna) was at his (her) friend Kevin's (Mary's) house and when Kevin (Mary) wasn't looking, David (Donna) took his (her) new ball home to play with. What might happen next?

Story Root 3:

Edward (Elaine) wants to be a member of the kids' club and when the leader said no, Edward (Elaine) offered the leader half of his (her) dessert at lunchtime. What might happen next?

---

[2]Note. From "Multiple consequences (M-CONS): Children's interpersonal problem-solving (ChIPs)" by M. Shure and G. Spivack, 1985, Philadelphia, PA.: Hahnemann University. Copyright 1985 by Shure and Spivack. Reprinted by permission.

Children who showed some difficulty were prompted with remarks such as "What do you think _____ might say or do?" All children were informed of ideas that were similar to previously listed ideas in that story root (enumerations) and told to try to think of something different. However, these enumerations were still recorded and considered part of the child's response. Up to ten possible consequences were elicited for each story root and scored according to guidelines specified in the manual.

APPENDIX F

Parent Information Sheet

Date: _____

Child's Name _____ Date of Birth _____
Mo/Day/Year

School _____ Grade _____

Has your child received remediation for reading difficulties? _____

Length of Remediation: _____

Has your child ever repeated a grade? _____

If so, which one? _____

Parent's Name: _____ Telephone Number: _____

Parent's Education: _____

Parent's Occupation: _____

Family Income: (Circle One)

a. less than $8000 a year

b. $8000 to 12,000

c. $12,000 to 16,000

d. $16,000 to 20,000

e. $20,000 to 24,000

f. $24,000 to 28,000

g. $28,000 to 30,000

h. $30,000 to 35,000

i. $35,000 to 40,000

j. over $40,000

APPENDIX G

Parent Consent Form

We the undersigned, give permission for our child (name) _____ to take part in a six week programme for improving children's social relationships and communication skills, offered by the Department of Psychology of Memorial University of Newfoundland. We have been informed of the details of the programme structure and understand that all the information involving our child will be kept confidential.

Signed _____
(Parent(s)/Guardian(s))

Date: _____

APPENDIX H

Referential Communication Training Programme

All six sessions of the referential communication training programme were derived from programmes described in the literature. They emphasized training in both speaker and listener skills. In all sessions at least two children played the part of the observer. The purpose of this was to make the relation between speaker and listener more salient, using the child-as-observer technique, in order to facilitate awareness of perspective-taking (Shantz, 1981). The overall outline was designed after Galutira (1985).

Session 1

This session was designed to encourage attention to the discriminating characteristics of a referent in the context of the alternatives from which it must be differentiated. Children were taught to detect differences between distinctive and nondistinctive features of referents (Whitehurst & Sonnenschein, 1978). Each child in turn was shown a set of eight drawings which contained both discriminating and nondiscriminating attributes. The target referent, identified for the child by a dot above it, was different from nonreferents on one of three characteristics. The child and experimenter sat with a barrier between them the experimenter gave the following instructions: "Tell me about the picture with the dot above it so that I know which one you are talking about ". Following each

description children were given feedback which emphasized their ability to identify distinctive features of the picture. Eight trials were administered to each of the four children while the other three observed.

Session 2

This session was designed to teach children the importance of context. Each child acted as listener, speaker, and observer in turn. A set of six identical paper cups were placed on a sheet of 8 1/2" by 14" paper. The experimenter hid a candy under one of the six cups so that only the speaker and observers knew where it was placed. The context in which the candy was placed was varied for each of six trials by changing the arrangement of the cups on the paper. The speaker's role was to tell the listener where the candy was hidden so that he/she could find it. The listener's role was to remain passive and therefore they were not permitted to ask questions when given ambiguous messages. The observers were encouraged to provide comments to the speaker as to the appropriateness of their clues and to make suggestions for more effective clues.

Session 3

This session was designed to improve children's judgments of message quality and to increase question-asking as a way of reducing ambiguity. Children were given a series of 16 cards of line drawings of people, elaborated from those used by Robinson (1981a). Each child alternated in the role of speaker, listener, and observer. The speaker's task was to describe one of the drawings so that the listener, sitting on the other side of a barrier, could pick the same card from his/her identical set of cards. Following the speaker's presentation of a message, each child was asked to make a judgment concerning its quality (i.e., bad or

good). If it was established that the message was of poor quality the listener was expected to ask questions to reduce the ambiguity of the message.

Session 4

This session was designed to enhance children's understanding of the need to reformulate ambiguous messages following feedback (Robinson, 1981a). With a barrier between them, the speaker and listener were given an identical series of six drawings, each of the same person, but with different characteristics. Each child and the experimenter took turns as the speaker, the listener, and the observer. When the experimenter was in the role of the speaker, the child was presented with both ambiguous and unambiguous messages. The role of the listener was again a passive one and thus was not permitted to ask questions for clarification. In the event of communication failure (i.e., the selection of an incorrect card), the following sequence of "whose fault" questioning occurred where children were encouraged to respond to the sequence of questions and to provide alternatives:

> We've got different cards, we went wrong that time. Whose fault was that, mine or yours? Why? Did I tell you properly which one to pick? What should I have said instead? Whose fault was it we went wrong? Why? (Robinson, 1981a, p. 240).

Session 5

This session was designed as a further extension of the skills taught in session four concerning the need for children to reformulate ambiguous messages. In contrast to the previous session, children were given explicit information about the inadequacies of their messages (Robinson, 1981b). For this task, children alternated in the roles of speaker and observer while the experimenter played the role of the listener. The object of the game was for the speaker to construct a

design using "Octons" which varied on the dimensions of colour (8), transparency (2), and spatial orientation. They then had to explain the design to the experimenter so that she could construct an identical one. When the speaker presented an ambiguous message, the experimenter explicitly informed the child of the problem (e.g., "I'm not sure which one you mean. Can you help me?") The observers were also encouraged to help the speaker reformulate the message.

Session 6

This session was designed to encourage the effective use of message sending and questioning through experimenter modelling (Cosgrove & Patterson, 1978). The experimenter presented a mapping game which involved describing a route on a map in such a way that the children could draw the same route on their map (Baldwin & Garvey, 1973). Each child in turn was then given a new map and asked to provide information to the group concerning a route printed on their map. In the role of the listener, the experimenter modelled appropriate questioning when faced with ambiguous messages.

APPENDIX I

Interpersonal Problem-Solving Training Programme

All six sessions of the interpersonal problem-solving programme were selected from the Interpersonal Cognitive Problem-Solving Programme (ICPS) by Shure and Spivack (1982). This programme is organized in a progressive sequence such that new skills are built on previously learned skills.

Session 1

This session involved pre-problem-solving skills and was designed to make children more aware of feelings including what makes the same child feel different ways, and why people feel the way they do. As well, children were also taught that things are not always what they seem to be and that there are lots of different reasons why people do what they do and why things happen.

In a group setting, children were shown a series of four pictures of a girl and four pictures of a boy with different facial expressions and given examples of feeling words (e.g., happy, worried, etc.). Above the drawings were a number of empty captions used to indicate what the child is thinking or saying. Each child was asked to suggest what could be written in each caption. They were also taught that *enumerations* were variations of the same theme, given examples, and asked to look for them as the responses were written down.

Children were then given two problem situations often encountered by their age group, and asked a series of questions about each one. For example, in one

problem situation *A* accuses *B* of taking something of theirs. The children were asked to think of something different that might have happened to the missing item. This was done using a brainstorming technique to elicit as many ideas as possible. They were then asked a series of questions concerning feelings: 1- "How might *A* feel when he/she thought that *B* had taken something of theirs?"; 2- "How might *B* feel when *A* insisted that he/she took the item, when he/she really didn't take it?"; 3- "How might *A* feel when he/she finds this out?" (Shure & Spivack, 1982). Then brainstorming was used again to elicit as many possible ideas concerning what *A* could have done before accusing *B*.

Session 2

This session involved a review of "Things are not always what they seem to be" by having two children role-play a problem situation as outlined by Shure and Spivack (1982) while the other two children observed and made suggestions. A similar series of questions to those in Session one were also used.

The children were then given an introduction to *alternative thinking*. This was taught using a game called "There's more than one way", designed to stimulate children's thinking of multiple alternatives to solving interpersonal problems. In addition, the exercise teaches children to classify solutions that are different and those that are similar. The purpose of producing multiple solutions was to help children recognize that when one solution is unsuccessful, it is possible to try other solutions. Two interpersonal problem situations were presented to the group as a whole, for which brainstorming was again used to elicit as many possible solutions, taking care to identify enumerations.

Session 3

This session involved a review of the concept of enumeration with reference to alternative solutions as well as *reverse* enumerations. Children were encouraged to present their own problem situations for which the group provided alternative solutions, the purpose of which was to increase generalization of this skill outside of the treatment group.

This session also included an introduction to *consequential thinking.* Children were again given examples of an interpersonal problem and, as a group, worked to provide alternative solutions. Once these alternatives were found, two solutions were chosen and the group was asked to provide examples of what might happen next if the particular solutions were carried out. These consequences were then listed and discussed.

Session 4

This session involved a review of consequential thinking using specified problem situations, including at least one problem situation encountered by a child in the group, in an attempt to generalize their skill further. As well, the skill of consequential thinking was further used to help the group evaluate their solutions and practice decision-making by picking the best and worst solutions based on potential consequences. Using examples of interpersonal problem situations, solutions were generated and enumerations identified. Each child was then asked to choose the best and the worst solutions, explain their choices, and role-play them.

Session 5

This session was designed as a review of the evaluation and decision-making process from the previous session and served as an introduction to *means-end thinking*. The purpose in training means-end thinking was to help the group learn to plan a sequence of steps to reach a specific goal. Using examples, the experimenter then modelled a number of possible steps toward meeting a stated goal, explained possible obstacles related to these plans, and ways of circumventing these obstacles. The group was also taught the importance of timing in reaching goals, by showing that sometimes it is better to wait. They then played a game of "continuation" where one child makes up a sentence to a story and then says "continuation". The child next to them is expected to continue the story further and then say "continuation", and so on to the next child. This game was designed to facilitate means-end thinking.

Session 6

This session involved a review of means-end thinking using the continuation game. As well, the group was presented with a dilemma situation, using a role-playing technique, in order to teach them to "weigh the pros and cons of what they do, taking into account other people's feelings, solutions and consequences, and how to avoid such problems in the future" (Shure & Spivack, 1985, p. 103). An overall review of the interpersonal problem-solving techniques taught in the six sessions was done in an attempt to show how all the component skills work together.

APPENDIX J

Attention Control Training Group

Session 1

In this session each child was given paper and coloured markers and was asked to draw various pictures (i.e., an animal, something they liked, and something they disliked) and tell the group a short story about each one. Following this, the group participated in a game similar to charades but which involved drawing a picture to represent a word or phrase rather than acting it out in pantomime. Each child took a turn at drawing while the others tried to guess the word or phrase. The children received points for guessing correctly.

Session 2

This session involved having children, as a group, play a game in which the experimenter presented the children with an unusual term, taken from the dictionary, and asked them to anonymously write down what they believed it to mean. If they didn't know the meaning, they were to write down a fake definition. All the responses were then returned to the experimenter who read them each out along with the correct definition. The children were then given an opportunity to guess the correct definition from the multiple choices. Three points were given if the child wrote down the correct answer, two points for guessing from the list of possible alternatives, and one point for each child who believed that their

definition was correct.

Session 3

In this session the group engaged in a game involving word categories. Children were shown a series of cards containing a letter. While presenting each card individually, the experimenter stated a category such as parts of the body, types of fruit, cars, or animals. The first child to call out a word in the particular category, starting with the letter given, won that card. The object of the game was to collec' ıe most cards.

Session 4

In this session children took part in a spelling board game. The game involved rolling a die and moving around a colour coded board. As each child landed on a coloured square the child to the right of them drew a card from the corresponding pile of coloured cards and asked the child to spell the word on the card. The colour the child landed on determined the difficulty of the word they had to spell, where more points were gained for correctly spelling more difficult words.

Session 5

This session involved having children, as a group, engage in a reading comprehension game. For this game children rolled dice and moved around a board marked with different directions. For each child's turn he/she was read a short paragraph and given questions to answer about its contents. For each question answered correctly, the child received points and the person with the most points at the end of the game won.

Session 6

In this session the group engaged in a game called "Continuation" which involved having children make up a story as a group. The experimenter started the game by presenting a few lines for the beginning of a story. Then each child in turn was called upon to produce a few lines to the story. When each child finished adding their section they said "continuation" and the next child was expected to continue the story.

Following the game of continuation, the children engaged in a memory game in which they were presented with a series of pairs of pictures lying face down on the table. Each child took turns flipping over two of the cards to reveal the pictures. If the two pictures matched the child kept the cards and was given another turn. If the cards didn't match the child turned them both back over and the next child was given a turn. The object of the game was to remember where each of the pairs were. The child with the most card pairs at the end of the game won.

APPENDIX K

Raw Scores

Table K-1

Raw scores for all subjects at all testing periods for the referential communication speaker task

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	111	109	111
2	104	78	130
3	80	84	74
4	84	111	90
IPPS			
5	81	105	114
6	14	94	134
7	62	112	119
8	6	37	106
Control			
9	84	121	132
10	91	115	118
11	96	87	119
12	102	101	124

Table K-2

Raw scores for all subjects at all testing periods for the referential communication listener task

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	2	10	10
2	8	7	7
3	1	2	4
4	5	5	5
IPPS			
5	4	6	8
6	3	9	9
7	8	10	9
8	2	7	4
Control			
9	2	9	9
10	4	10	8
11	2	8	7
12	6	7	9

Table K-3

Raw scores for all subjects at all testing periods for the means-end problem-solving measure

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	3	3	3
2	5	4	5
3	4	2	5
4	9	5	6
IPPS			
5	9	4	8
6	3	5	3
7	5	10	5
8	4	6	5
Control			
9	4	5	8
10	4	5	8
11	5	4	4
12	4	8	3

Table K-4

Raw scores for all subjects at all testing periods for the multiple consequences problem-solving measure

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	9	6	6
2	8	11	12
3	8	6	11
4	8	10	9
IPPS			
5	10	12	12
6	7	7	13
7	12	9	8
8	5	9	12
Control			
9	10	9	9
10	10	9	9
11	8	10	11
12	9	6	6

Table K-5

Raw scores for all subjects at all testing periods for the social self-concept measure

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	15	16	17
2	6	6	13
3	19	16	24
4	10	10	13
IPPS			
5	19	24	24
6	21	24	24
7	24	23	17
8	21	20	22
Control			
9	21	19	17
10	10	1	23
11	20	24	23
12	19	15	13

Table K-6

Raw scores for all subjects at all testing periods for the positive peer nomination ratings

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	1.00	0.40	0.80
2	0.00	0.75	0.80
3	0.60	0.75	0.60
4	0.00	0.40	0.40
IPPS			
5	0.00	0.20	0.40
6	0.80	0.60	0.60
7	0.60	0.75	0.80
8	0.66	0.50	0.60
Control			
9	1.00	1.00	1.00
10	0.50	0.60	0.60
11	0.00	0.00	0.00
12	0.00	0.00	0.00

Table K-7

Raw scores for all subjects at all testing periods for the negative peer nomination ratings

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	0.00	0.00	0.00
2	0.60	0.00	0.20
3	0.40	0.25	0.40
4	0.33	0.00	0.20
IPPS			
5	0.00	0.20	0.40
6	0.00	0.20	0.16
7	0.00	0.25	0.00
8	0.00	0.00	0.00
Control			
9	0.00	0.00	0.00
10	0.33	0.20	0.40
11	0.83	0.20	0.80
12	0.40	0.50	0.40

Table K-8

Raw scores for all subjects at all testing periods for the roster ratings

	Time		
Group	Pre	Post	Fol
Ref. Com			
1	1.50	1.20	1.80
2	0.60	1.50	1.20
3	1.25	2.25	1.75
4	1.25	2.00	2.00
IPPS			
5	1.50	1.60	1.50
6	2.50	1.40	2.50
7	2.00	2.00	2.25
8	1.75	1.75	2.00
Control			
9	2.60	2.60	2.80
10	1.83	2.16	2.25
11	0.66	0.80	1.00
12	1.20	1.40	1.40

APPENDIX L

Means and standard deviations for all measures at all times

Table L-1

Means (standard deviations) for all treatment groups on interpersonal problem-solving measures at all testing times

	Group		
Measure	Ref. Com	IPPS	Control
MEPS			
Pre	5.25 (2.63)	5.25 (2.63)	4.25 (0.50)
Post	3.50 (1.29)	6.25 (2.63)	5.50 (1.73)
Fol	4.25 (1.26)	5.25 (2.63)	5.75 (2.63)
M-CON			
Pre	8.25 (0.50)	8.50 (3.11)	9.25 (0.96)
Post	8.25 (2.63)	9.25 (2.06)	8.50 (1.73)
Fol	9.50 (2.65)	11.25 (2.22)	8.75 (2.06)

Table L-2

Means (standard deviations) for all treatment groups on referential communication measures at all testing times

	Group		
Measure	Ref. Com	IPPS	Control
SPEAKER			
Pre	94.75 (15.09)	40.75 (36.49)	93.25 (7.63)
Post	95.50 (16.94)	87.00 (34.15)	106.00 (15.19)
Fol	101.25 (24.43)	118.25 (11.79)	123.25 (6.40)
LISTENER			
Pre	4.00 (3.16)	4.25 (2.63)	3.50 (1.92)
Post	6.00 (3.37)	8.00 (1.83)	8.50 (1.29)
Fol	6.50 (2.65)	7.50 (2.38)	8.20 (0.96)

Table L-3

Means (standard deviations) for all treatment groups on social self-concept measure at all testing times

	Group		
Time	Ref. Com	IPPS	Control
Pre	12.50 (5.69)	21.25 (2.06)	17.50 (5.07)
Post	12.00 (4.00)	22.75 (1.90)	17.75 (4.86)
Fol	16.75 (5.19)	21.75 (3.30)	19.00 (4.90)

Table L-4

Means (standard deviations) for all treatment groups on social status measures at all testing times

	Group		
Measure	Ref. Com	IPPS	Control
POS. PEER NOM.			
Pre	0.40 (0.49)	0.52 (0.35)	0.38 (0.48)
Post	0.58 (0.20)	0.51 (0.23)	0.40 (0.49)
Fol	0.65 (0.19)	0.60 (0.16)	0.40 (0.49)
NEG. PEER NOM			
Pre	0.33 (0.25)	0.00 (0.00)	0.39 (0.34)
Post	0.63 (0.13)	0.16 (0.11)	0.23 (0.21)
Fol	0.20 (0.16)	0.14 (0.19)	0.40 (0.33)
ROSTER RATINGS			
Pre	1.15 (0.39)	1.94 (0.43)	1.57 (0.80)
Post	1.74 (0.48)	1.69 (0.25)	1.74 (0.80)
Fol	1.69 (0.34)	2.06 (0.43)	1.86 (0.81)